







Indian Fields.  
Oil Spring. SE of hotel. At the Oil  
spring. Also location of Soda  
spring.

Level of the Soda Spring.

- 14" Fissile Black shale.  
3" More solid layer, earthy, bluish  
gray, weathering irregularly  
shaly.  
12" More shaly, part of it (near top)  
very fissile and black.  
10" Solid, light brown, like breccia-  
ted layer, but not brecciated.  
12" Strongly brecciated and weather-  
s so as to bring out this brecciated  
idea splendidly!!! Wish I  
could get a photograph. *Clebsite*  
*Crinoid stems*. *Cyathophylloids*  
and *Favosites* & *Corals*.  
2" Black shale.  
14" Solid, light brown limestone.  
Grains black nodules near  
base, up to  $5/8$  in. in length.  
Oil spring issues at this  
level or just below.

in 20m  
Top of hill with nodules, fossiliferous,  
35-40 ft Black shale  
15 ft Clay layers in Black shale, especially  
in lower part.  
75 ft Black shale  
Soda Spring.



North east of hotel 100 yds, in  
a little run west of the creek,  
Oil Springs hotel.

### Black shale

- 10 in solid limestone.
- 10 in brecciated layer
- 14 in solid limestone.
- 18 in limestone with small cavernous.
- 18 in poorly exposed solid l. in part
- 4 in bit exposed, soft
- 15 in solid limestone, hard, siliceous
- 1 in rotten stone.
- 5 in 9 in brown stone with nodules.
- 4 in rotten stone
- 4 in tan brown limestone with black nodules.

see next page

- A 46 in. crinoidal within 1 ft of  
base. with corals (Hind's  
also?) Chert in middle  
+ upper part.
- 18 in Argillaceous rock.

Lowest D. et. with fish teeth, tubes -  
and other plates. Black nodules.

8 R. Plum creek locality.  
Photo 1. Plum creek clay.

Plate A. Plum creek clay.

On west side of Plum creek  
east of the road.

Photo shows top of Plum  
creek clay. The top is slight  
ly below creek level here.

Thickness of Plum creek clay  
exposed here is 5 ft 3 in.

Elkins limestone rather heavy  
here.

Directly east of George Mc  
Intosh house.

Elkins limestone.

lower half  
Cyathophylloids, calymenae were here.  
{ Leptæna rhomboidalis.  
Dolomella elegantula.  
Platystrophia longimensis 3 feet at  
base of lower layers about 6 ft below  
the top.

weathers  
{ Strophomena like flat but  
apparently with subtriangular  
net line.  
Stricklandia near top.

13 ft testill clay.

14 in. = 2 ft layer limestone.

17 ft Hard limestone + claystone.

18 in. Argillaceous light brown limestone

1 ft crinoidal l. with corals.

A 6 in. soft argillaceous rock.  
see preceding page.



Along top of road, overlying  
what is left of Black shale,  
between Plum creek &  
Tipton ferry, = sand and  
quartz pebbles  $\frac{3}{4}$  in long in  
some cases. Irregular for-  
mation.

N side of Tipton ferry.

16 ft 2 ft layer to base of  
Devonian.  
Collected Waco fossils

Photo 2 Devonian limestone  
along RR  
West of Clay City.  
Irisia

Opp. Green McDowell's house.  
1 mi West of Clay City

East of loc. 2, 1 mi. SE of Indian  
Fields, along the road running  
north, on the north side of Lub-  
good creek.

Devonian  
20 ft Clay with Waco l. beneath = 8° 3"  
9 in. l. = 2 ft layer.  
13 ft Estill clay  
6 ft Elkins limestone, exposed  
5 1/2 ft not exposed.  
Lubgood creek

Brown low Brunner.

1/4 mi. S of Indian Fields.

Devonian  
20 ft. clay, Waco fossils.  
9 in. limestone = 2 ft layer.  
Just west of road here  
(Top of Elkins limestone with  
Strophomena in bottom  
of creek.)  
13 ft Estill clay  
Top of Elkins limestone  
with Strophomena,  
measured with John Coff.



Along North Fork of Lul-  
low Creek, 1 mi. E of  
North of Riddville.

36 ft about estimated  
50 ft about estimated interval  
29 ft pseudo Madison measured  
21 ft estimated  
136 ft Richmond measurement  
mid of curve

8 p.m. ~~Photo 3~~ Contrast of Irvine  
Plate C. Tertiary clay  
penetration & R.R. also  
running above the  
2 miles. Taken from  
point slightly east of  
most northern point of  
Riddville, looking  
North Fork of Riddville,  
Direction of view, towards  
SE from here.

Photo 4 Richmond below  
Plate D. Clinton, at  
Hornback curve of L & E  
R.R. = 1 1/2 mi. W of Indian  
Falls.

70 ft to mile grade

Photo 5 2nd cut west of  
Plate E Hornback curve.  
Lower part of Richmond,

Photo 6. Lowest Richmond,  
just E of upper Lawrence -  
passing along P.R. east of  
Lulow. Some more in other  
notebook. Collected & sent  
Richmond here for analysis,  
20 ft of this section.

Immediately above is clay  
rock of Middle beds of  
Richmond.

Immediately below is thin  
shaly section at base of  
Richmond, not exposed,  
probably 20 ft thick, but  
impossible to tell.  
Lignite beds here.

The house on N side of road at  
eastern Lignite exposure is  
that of Tom W. Abbott.

2nd cut E of Abbott's Lignite ex-  
posure. Lowest part of Middle  
Richmond with yellow  
clay exposure. Collected  
for analysis. 30 ft up to  
massive layer at west end of  
cut. 3 miles west base.



~~Fossiliferous layers well  
exposed at extreme east  
of this cut. Strata are  
plumb line, for day,  
about 100' distant,  
and at a distance of 100',  
probably 100' with the same  
capacities.~~

17 ft. of thin bedded rock  
above the fossiliferous  
layer. Fossiliferous  
at least just at top of  
bedding from the  
top of ash. Collected at  
here.

Plots 1, B, of Elk River, Platte creek &  
 Platte River [top of Clinchian]  
 I say  
 7 ft Elk River to west side  
 5 ft Platte creek & say  
 2nd cut to of Horse Backs river

Est. clay is above. Some  
place is just west of the  
great fall.

At West pit = Black shale  
18 in. Devonian beds, decayed  
7 ft. over which is a thin layer



Shine clay at great day  
part 3/4 mile west of Indian  
fields. Various from 2 to  
5 ft in thickness. Contains  
fossils, is very sandy.

Photo 2 B. View across the  
mine from the  
road beyond from  
my part 3/4 mile west of  
mine south east of  
cut road.

Photo 3 B. View across the  
mine from the  
road beyond from  
my part 3/4 mile west of  
mine south east of  
cut road.

Photo 4 B. View of 9 m.  
2 foot ledge at locality  
east of Brancher Bruner.

A1. 1 mi NE of Kiddville, along  
road following North  
Fork of Gulbequid, West of  
Clark Cr. Lower Richmond  
Middle Part, Aug. F. Foerste,  
Aug. 1905.

B1. 2 mi. W. of Indian Fields, at  
first cut east of Tom Will  
Abbott. Clark Cr. Lower  
part of Lower Richmond,  
Aug. 1905.

B2. 2 mi. W. of Indian Fields, at  
2nd cut east of Tom Will Abbott.  
Middle part of Lower Richmond.

B3. Cut just west of path leading  
down to Jim Hornback.  
17 1/2 - 25 ft above heavy  
ledge at base of Middle  
Richmond.

B4. 22-35 ft below level of Clinton.  
Base of Upper Richmond.  
Hornback Curve, 1 1/2 mi.  
W of Indian Fields.

B5. Hornback curve. Middle part  
of Upper Richmond.  
Below base of Clinton.

B6. Hornback Curve. Top  
Richmond. 0-10 ft



B. 7. Cut east of Hornback curve,  
1/4 mi. W of Indian Fields,  
Clark Co. Massive base of  
Clinton or Brasfield bed.

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B. 8. 2nd cut E of Hornback, Upper  
well bedded part of Clinton,  
or Brasfield bed, 1/4 mi.  
W of Indian Fields.

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B. 9. Plum creek clay, 2nd  
cut E of Hornback curve,  
1/8 mi. W of Indian Fields,  
This is last in photo ex-  
posure.

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B. 10. 3rd cut E of Hornback  
Curve. Elkins lime-  
stones.

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B. 11. Ferruginous layer near  
top of Elkins limestone,  
= 0 to 2 ft below top, just  
W of great fill 1/2 mi W.  
of Indian Fields.

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B. 12. Estill clay, 1st cut west  
of great fill. W of Indian  
Fields, 1 mi.

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B. 13. Waco limestone, 1 mi. SE  
of Indian Fields 1/8 mi.  
E of Brown Blower, N of  
Lubbeys up N road.

B. 14. Big clay pit 1/2 mi. West  
of Indian Fields, Crab  
 Orchard clay proper.



I

No 1269. page 16. Limestone Iron  
ore bank. one and a half miles  
from Old Slato Furnace, Bath  
Co. Bed 10-12 ft thick, (in?)  
the Clinton Group. Collected  
by Philip N. Moore.

II

No 1652. p. 18. Limestone from  
Slato Furnace Ore banks.  
Howard's Hill. Upper Silu-  
rian formation. P. N. Moore.

No 1653. p. 19. Upper part of  
bed of preceding.

No. 1654. Limestone ore at  
Chalybeate Springs, Pilot  
Mount. P. N. Moore.

No 1655. Limestone found to  
be 20 ft thick, from near  
Owingsville on road to  
Slato creek. P. N. Moore.

Madison Co.

2168. p. 51. Rept. 4. Clay; Milton  
Barlow, from near Bybee-  
town, Bed 4 feet thick, in  
Black Shale. John R. Proctor.  
Clay of a light, iridescent-  
grey color. Irregularly  
and imperfectly laminated.  
Quite plastic. Burns to a  
dlicate light reddish-  
cream color; nearly white.

2169. Clay of workable thickness;  
on the road leading from  
Waco to Reddham, about  
a mile and a half from  
Waco. Probably below the  
Coniferous limestone. John  
R. Proctor.

A compact clay, generally  
of a light olive-grey color,  
stained irregularly  
with ochreous & ferruginous  
quite plastic. Calcareous.  
quite hard, of a hand-  
some light brick color.

2170. Indurated clay, from of C. L.  
Searcy, near Ellistown. Be-  
neath the Coniferous limestone.  
Bed 10 ft thick more or less.  
A light, olive grey, laminated  
clay, mottled with  
ochreous or orange-colored



ferruginous infiltrations.  
The laminæ are contorted.  
It is quite plastic. Burns to  
a handsome flesh color.

Dried at 212° F.

Silica	62.56	64.566	62.58
Alumina	24.78	20.16	22.94
Iron peroxide	1.80	4.20	3.76
Lime	Trace	.213	.56
Magnesia	.317	.641	.425
Pot ash	3.276	5.054	5.28
Soda	.294	none	.308
Combined H <sub>2</sub> O + loss	6.973	5.166	4.147
	No.	No.	No.
	2168	2169	2170

Madison continued

Marly shales of Madison Co.

2186. page 52. 4th Rept.

Anderson Lake  
300 yds W of  
Drowning creek.

Marly shale, in the road  
near A. Lake's place. Drown-  
ing creek. Niagara group.

On drive grey or brownish  
grey, somewhat firm shale,  
mottled in parts. Quite  
plastic with water when  
powdered. Calcareous to a  
light brick color.

2187. Marly shale or indurated

marly clay. On the hill  
200 yds south of Dr. Free-  
man's house. Probably the  
same bed as No 2170. Be-  
neath the Coniferous  
limestone. The bed is 6  
ft thick or more, and con-  
tains gypsum. J. R. Porter

2 mi S E of Port aux  
Lac, in E side of  
the lake.

Generally in thin soft,  
irregular laminæ,  
of a light olive-grey  
color, irregularly variegated  
with brownish yellow or  
ochraceous. Contains  
gypsum in irregular  
crystals. Is quite plastic  
with water. Burns quite  
hard, of a handsome  
light brick color.



Silica	42.30	48.78
Alumina	20.84	17.32
Iron peroxide	4.12	3.24
Lime sulphate gypsum		19.285
Lime	13.32	
Magnesia	.461	.496
Pot ash	2.387	4.768
Soda	.351	.24
Combined H <sub>2</sub> O, CO <sub>2</sub> & loss	16.221	5.871
	No	No
	2186	2187
		Just below Devonian

## Madison Co. Limestones.

2189. Shelly limestone in bed of Muddy creek, below J. A. Crompton's, "Cumberland and shales" Probably Clinton. John R. Procter. Of a dark mass - grey color. Generally quite friable; some portions are compact.

2190. Impure limestone, top of Cumberland and shales, upper 12 inches. Found below the mill-dam on Muddy creek. Consists of a pretty firm, fine-grained, compact rock, of a handsome light olive grey color.

2191. Impure limestone, top of Cumberland and shale. From 18 to 30 inches below the massive limestone of the Silurian on the creek.

Rather darker than the next one. Color inclining to bluish, not so hard as that.



2192. Impure limestone resting on top of Cumberland shales. Bottom stratum. From below the mill dam on Muddy creek.

A granular limestone, somewhat cellular, containing some petroleum, which gives it a brownish color. It weathers ochraceous.

2193. Impure limestone, Niagara, Top stratum. 8 in. thick. From below the mill dam on Muddy creek. Cellist on.

An impure granular limestone; somewhat cellular, dark brownish-grey, somewhat mottled, contains petroleum, the infiltration of which gave the dark color to the rock. Weathers ferruginous.

2194. Impure limestone. Second from top. From just below mill dam on Muddy creek. Cellist on. Resembles preceding, but is darker colored. Contains petroleum + some iron pyrites.

2195. Impure limestone. Niagara, Third stratum from top. From below mill dam on Muddy creek. Cellist on.

Resembles preceding, rather finer grained and harder. Contains petroleum. Exterior surface weathers ferruginous.

2196. Impure limestone, Clinton group? From the quarry north of Rogersville.

A compact a fine granular rock, somewhat crystalline, of an olive grey color, in some parts brownish. Contains some iron pyrites.

2197. Limestone from below the Canada-gallie pit at the base of the Corniferous limestone.

A fine granular, brownish grey rock, gives the odor of petroleum when heated, and probably owes color to this source.



2198. Bituminous limestone  
from above the Coniferous  
limestone, 3-10 ft thick,  
from near Elliston.

Generally of a dull,  
brunish black, or grey  
black color. Some pieces  
with bands of a lighter  
grey tint. It is a fine  
granular rock.

2199. Impure limestone. Top  
of the Coniferous lime-  
stone. Total thickness  
15 feet, with intercalated  
beds of pure limestone  
6 in. or thicker.

A tough fine granular  
or compact rock.

Samples from different  
levels are mixed. Some  
are brownish-black,  
someumber-colored,  
and some intermediate  
in tint.

2200 Limestone, on the road  
one mile south of Mrs  
S. J. Embry, intercalated  
with the so-called Black  
Band, a bituminous  
limestone.

A dull buff grey fine  
granular rock, with some  
little infiltration of  
hydrated iron oxide.

lime carbonate	48.53	37.76	33.56	45.70	50.86	50.96
Magnesia "	11.79	10.05	6.855	27.475	20.10	27.972
Alumina		17.656	21.256			
Phosphoric acid	10.33	.204	.204	11.360	9.96	5.96
Iron peroxid		3.70	4.120	3.50*	3.90	3.556
Iron sulphid						.576
Potash	1.696	.458	.578	.501	.276	.276
Soda	.347	.090	.045	.088	.054	.087
Bitumen, loss				1.396	10.87	6.493
Water & loss	6.567	4.902	4.302			
Siliceous matter	20.74	25.18	29.08	9.980	3.98	4.12
Gr of lime	27.173	21.145	18.794	25.592	28.48	28.538
" " magnesia	5.614	4.785	3.251	13.083	9.608	13.319
" " silica	Not est	20.98	22.80	Not est	not est	Not est
	Not	Not	Not	Not	Not	Not
	2189	2190	2191	2192	2193	2194

\* mostly ferrous oxide



Lime carb.	51.20	35.16	43.06	41.15	36.58	47.58
Magn. Carb.	25.124	4.646	9.994	13.908	18.541	17.133
Alumina	12.36	10.706	29.42	9.04	4.01	
Phosph. acid	.146	.754				10.98
Iron peroxid	4.46	2.060	2.640	1.89	1.540	
Iron sulphid	—	—	—	—	—	—
Soft ash	.287	2.033	.770			
Soda	.049	.586	.149	13.022	7.339	Not est.
Bitum. & oils	2.46	—	11.287			
H <sub>2</sub> O & loss	—	4.275	—			6.117
Silic. residue	3.92	39.78	22.68	20.99	31.99	18.19
Gr of lime	28.672	19.689	24.113	23.044	20.485	26.645
Gr of magnesia	11.889	2.212	4.756	6.384	8.781	8.158
Gr of silica	Not est.	Not est.	Not est.	Not est.	Not est.	Not est.
	No	No	No	No	No	No
	2195	2196	2197	2198	2199	2200.

2200 Int earthy Black shale.

2198 Earthy Black shale.

2199 Dev.

2197 Dev.

2193 Elkins l?

2194 Elkins l? or Clinton?

2195 Elkins? or Clinton

2192 Base of Clinton

2190 Richmond

2191 Richmond

2189 Richmond



Madison Co.

2209. page 62. 4th Rep.

Sulphur water from a spring  
on the farm of C. L. Searcy,  
Calliston. In the Niagara  
Group.

Composition of Saline contents  
of this water, in 1000 parts.

Lime carb.	.2040	} Held in solution by carbonic acid.
Magnesia carb.	.0322	
Iron carb + phosphoric acid	.0172	
Silica	.0045	

Lime sulphate	.4301	} Left dis- solved in H <sub>2</sub> O after long boiling.
Calcium chloride	.0124	
Magnesium chloride	.0920	
Potassium chloride	.0380	
Sodium chloride	.3221	
Soda carbonate	.0937	
Silica	.0018	
Lithium strontium + sodium sulphate	— traces	
Organic matter + loss	.3294	

Total solid matter in 1000  
parts = 1.5774.

Free CO<sub>2</sub> & H<sub>2</sub>S not deter-  
mined.

Byyle Cr.

2281. Phosphatic nodules  
(coprolites) at base of  
Marble, Byyle Cr.

Bituminous matter,  
Ferrus carbonate,  
29.10 % of P<sub>2</sub>O<sub>5</sub>



Nelson Co.

2393. Sandstone. Phosphatic,  
From the black Devonian  
slate in the Boston dis-  
trict, locally 10 in. thick,  
Contains fish & other organic  
remains.

Grey sandstone, mostly  
made up of hyaline  
grains of quartz, some-  
what rounded, mixed  
with dark colored gran-  
ules and broken organic  
remains.

67.04 silica.

{ Alumina  
Iron oxid  
lime  
magnesia

11.162

.019

P<sub>2</sub>O<sub>5</sub>

Potash

Nelson Co.

2394. Limestone - ferruginous,  
From near top of upper Hud-  
son River beds, Cumberland  
sandstone & shales, near  
farm of S. P. Stiles. 4 mi.  
N. of Bardonia.

A fine grained or rock of  
dull grey color, brownish  
yellow in weathered por-  
tions.

2395. Limestone ferruginous.  
From near S. P. Stiles  
farm. Cumberland sand-  
stone & shales.

A fine granular rock  
of brownish yellow  
ochre color.

Lime carb.	81.58	61.24
Magn. carb	1.501	8.915
Al. + Iron oxid	2.978	4.317
P <sub>2</sub> O <sub>5</sub> Phosph. acid	1.202	.563
Potash	.423	.443
Soda	.248	.254
Siliceous residue	11.120	22.52
Moisture & loss	.948	1.748
	Nr	Nr
	2394	2395



# Clark Cr.

2469. Phosphatic limestone.  
Stewarts Mill. Sulphur  
creek. Clark Cr. Crickany  
formation.

A dark brown, con-  
glomerate rock, contain-  
ing many dark colored  
fragments of fossil organic  
remains.

2470. Phosphatic limestone  
From near Howard's creek  
Clark Cr. Crickany  
formation? An im-  
pure fossiliferous lime-  
stone rock, grey brown  
with ochreous material  
in spots, contains fossil  
impressions.

Lime carb.	21.38	33.98
Magn. carb.	3.055	11.185
Alp & iron oxid	ne	nd
P <sub>2</sub> O <sub>5</sub>	9.71	1.842
Pot ash	.83	nd
Soda	.228	nd
Siliceous residue	27.58	31.72
	110	110
	2469	2470

# Lewis Cr.

2484. Limestone, hydraulic.

Sent to Mr. Provter by Mr.  
W. J. Richardson of Vancou-  
ver, Lewis Cr.

A dull grey fine granular  
rock, with faint lines of  
stratification.

Lime carb.	48.79 = 27.322	lime
Magn. carb.	37.482 = 17.834	
Iron oxid + al	2.49	magn
P <sub>2</sub> O <sub>5</sub>	.143	
Pot ash	.49	
Soda	.058	
Soluble silica	1.150	
Insoluble silica + silicates	8.850	
Moisture + loss	.547	



# Madison Co.

2496. Shaley clay. From land of F.W. Lewis. 2 miles S of Bottom, about 100 yds to the left of Big Hill turnpike, about sp. the black mottled clay of F.W. Lewis. Bed 4-5 ft thick. On Niagara slab. Same of upper 10 in. Laminated clay with soft edge of a light M. Fisher, grey color on the exterior, darker colored + brownish yell with grey in the interior.

2497. Shaley clay, same as last. From 10-20 in. below surface. M. Fisher.

Silica	59.000	42.56
Al. = 20.68	Or. perox. 396.	24.64
Lime	1.456	8.68
Magnesia	1.096	7.247
Pot ash	5.500	4.819
Soda	.217	.166
H <sub>2</sub> O, CO <sub>2</sub> & loss	8.091	15.548
	100.	100
2496		2497

# Madison Co

2499. Marly shale Eng chm Pogg's land, 4 miles south (= NE?) of Berea near the road from Berea to the Big Hill Turnpike, by way of Bottom. The locality is called Blue Lick. Wavy formation resting on Black shale. Mostly Fisher.

Silica	69.152
Al + Iron perox	20.39
Pr. V5	trace
Lime carb.	.145
Magn. carb.	2.289
Pot ash	3.754
Soda	.747

Combined H<sub>2</sub>O + loss 2.920.



# Lincoln Co.

1873. Clay from head waters  
of Green river, on land  
of Mr. Thos. W. Varman.  
Bed 2-4 ft from  
the surface, said to be  
42-45 feet thick,  
resting on black shale  
which is 50 ft thick.  
Clay imperfectly laminated  
of a dark olive-grey  
color. Burns to a  
grey buff color.

Silica.	61.58
Alum.	23.946
Iron peroxide	5.814
Lime	.201
Magnesia	.850
Pot ash	1.542
Soda	.362
H <sub>2</sub> O + loss	5.705
P <sub>2</sub> O <sub>5</sub>	Not detd.

1874. Crab Orchard Springs  
Salts. put up by Crab  
Orchard salts Co.  
of B. Wil der & Co. Louisville.  
1875 Crab Orchard Salt.  
Arthur Peter Co.  
Louisville.

Mag. sulphate	54.842	60.627
Soda	13.566	8.26
Pot ash	2.707	2.814
Lime	2.149	1.795
Lithia	.038	.028
Sodium chloride	2.954	1.874
Lime carb.	.032	.018
Mag.	.089	.036
Iron peroxide	.078	.028
Silica	.124	.118
H <sub>2</sub> O of crystalli-	23.421	24.402
zation + loss		
	112	112
	1874	1875



# Madison Cr.

1876. Potter's clay. Quality 1.  
Upper Silurian.  
2 mi. E of Richmond.

A light soft grey clay  
with some ochreous  
stains + infiltration.

1876. Potter's clay. Quality  
2. Same locality  
of a bluish grey color.

Silica	59.976	56.96
Al. Iron & mag. Oxid.	27.640	28.74
Lime carb.	.280	.20
Magnesia	.606	.752
Pot ash	3.931	2.502
Soda	.547	.315
Combined H <sub>2</sub> O + loss	7.020	10.531
	Nr	Nr
	1876a	1876b

# Bath Cr.

For Olympian & Springs  
see p. 17. (363 cut series)

1989. Ferruginous Magnesian  
limestone. in the diatom  
under Black Devonian  
shale.

Lime carb.	54.06
Mag. carb.	34.027
Iron carb.	11.532
Pot ash	.006
Soda	.143
Silica	.040
	.280



# Bath Co.

- 2575 Iron Ore. from Carnel  
Rice. property of Captain  
W G Allen. Clinton  
Ore of yellowish brown  
color of usual struc-  
ture in Clinton iron ore.
2576. Iron Ore from Purvis  
lands. Clinton. Reddish
2577. Iron Ore. Wm Warren  
near head of Rock Run  
Bath Co. Clinton.  
Ore of structure of Clinton  
ore, reddish brown color.

Iron per cent.	47.63	51.43	58.570
Al.	5.468	5.132	3.72
Lime carb.	16.560	13.08	15.16
Magn.	9.974	9.444	4.528
P <sub>2</sub> O <sub>5</sub>	1.202	1.138	1.01
Silica	7.16	7.800	6.96
H <sub>2</sub> O expelled at 212	1.143	.693	1.607
CO <sub>2</sub> H <sub>2</sub> O &c.	10.863	11.283	8.445
Gr of iron	36.001	40.999.	
	NV	NV	100
	2575	2576	2577

# Fleming Co.

Wells, see p. 39, Part 3 A.

Wells Marion Co.  
see p. 129, Part 3 A.



## Index,

Black slate limestones  
Bullitt Co. Vol 2, OS. p. 141-440  
Madison Co. Vol 4. OS. p. 119-888  
Madison Co. 4 OS. 212-1123  
Nelson Co. 3. OS. 343-711

What are Black slate  
limestones?

Coniferous limestones

Madison Co. Vol V. NS. p. 451  
No. 2199

Madison Co. Vol V. NS. p. 451  
No. 2200

Jefferson Co. Vol 4 OS. p. 195  
Upper Sil? No 1077.

Jefferson Co. Vol 4. p. 195.  
Upper Sil.? 1078.

Upper Silurian Niagara

Bullitt Co. Vol 4. OS. p. 105.  
Nos. 856, 857

Estill Co. Vol 4 OS. p. 146-947

Garland Co. Vol 4. OS. p. 156-985

Madison Co. Vol 5. NS. p. 449  
Nos. 2193-2194 2195

Nelson Co. Vol. 4. OS. p. 231.

Nos. 1166 a. 1167.

Jefferson Co. Vol 4. OS. p. 185-  
1077-1081.

Clinton.

Bullitt Co. Vol. 4. OS. p. 68-796

Fleming Co. Vol 4. OS. p. 151-973  
797

Crab Orchard clay

Madison Co. Vol V. NS. p. 445,  
Nos 2169, 2170.  
p. 446, No 2186-2187.

Upper Silurian nearly clay.  
Jefferson Co. Vol 4. OS. p. 192.  
Nos. 1069, nearly shales.

62 9 41  
777 1

7.5



# Boyle Cr.

No. 2270. Chalybeate Mineral Water. From a well 8 ft deep, at the Camp Ground near Danville Junction. E D Fox.

2271. Old Chalybeate Spring Water. on Knoxville branch of L & N R R. + half a mile from Danville Junction, at Alum Springs.

Joseph Maxwell  
2272. Chalybeate Water. From the so-called Pleoporus Spring. Alum Springs.

CO<sub>2</sub> not est.

Held in solution by CO<sub>2</sub> { FeCO<sub>3</sub>  
MgCO<sub>3</sub>  
CaCO<sub>3</sub>  
MgCO<sub>3</sub>

See next page.

FeSO <sub>4</sub>	
Sulphate of Potash	.1977
" lime	.0235
" soda	.2917
" magn.	.1521
mag. chloride	.2250
Sodium "	
Free H <sub>2</sub> SO <sub>4</sub>	
Silica	
undetermined + loss	

No. 2270

Photo 5. B. R R cut at Brassfield. The Devonian forms 3 massive layers, and the earthy Black shale forms the top layer, about as thick as the middle layer of Devonian limestone.

Photo 6 B. Photo, east side of 2 views, looking from road 1/4 mi W of Brassfield across R R + Allegheny valley to Darvin, Penn. junction + further beyond.

Photo 1 C. Photo West side of preceding.

Brassfield locality,  
Devonian l.  
15 ft clay = Estell.  
Allegheny limestone, at middle of first stripplit stratum  
after 1st bend SE of Brassfield. The shale and limestone is white by exposure - also = exposure of distance E of fence  
Other places to distance 30-32 ft interval from top of Allegheny to top of very massive Brassfield limestone.



No 25. Elkino limestone in  
R.R. cut, 2nd cut east  
after 1st turn SE of Brass  
field. 7 ft. Elkino l.  
exposed, with weathered  
clay on top.

No 3C. Elkino limestone 11 ft  
overhanging ledge.  
304" Elkino limestone? more clay.  
Clay section Plum Creek.

No 4C. Photo. Elkino limestone  
11 ft. Top thin and shelly  
for 2 ft.  
304" Elkino limestone  
thin overhanging ledge  
clay, Plum Creek.

No 5C. Photo. Elkino lime-  
stone, all the more  
massive part is 9 feet  
thick, is not exposed.  
Clay at base covered by  
rubble clay.

No 6C. Photo. Plum Creek clay,  
4 ft 3 in. thin, level bed  
at base of clay. Payson  
limestone at top.

Corrected section from Brass  
field to Panola.

Darwinian  
15 ft. Estill clay  
11 ft. Elkino l., upper 2 ft in, thin.  
3 ft 4" Elkino l. more clayey.  
3 ft 3 in. clay, Plum Creek.  
1 ft 10 in. Thin layer of clay.  
20 6" Massive l. with 6-9 in. white  
part at top.

Large crinoid heads here,  
white part in lower part  
of massive layer just  
above.  
1203" from top of crinoid head  
horizon to top of the very  
massive layer.  
6" at least of very massive l.

Bygonia in Estill clay near  
Brassfield, and in clay  
over Naco limestone near  
Panola.



Irwin, Ky.

up to Devonian  
clay with not appreciable shale  
7 1/2 ft abundant thin arg. shale & clay.  
10 ft Water limestone  
2 ft limestone  
14 1/2 ft testill clay  
tallies limestone with  
stick and iron near top.

Az Plate Top first layer + over-  
D7 Plate dipping Water with  
just a trace of overlying  
Crat or chert clay  
beneath the soil?

Hugh R. B. about  
10 ft or more down in  
roofs.

7 1/2  
10

Loc

65

East of College Hill.

Per I must be  
14 ft Water & overlying clay.  
8 in = 2 ft layer.  
14 ft testill clay.  
11 ft { tallies limestone with iron  
{ thin limestone with bedded at top  
4 ft 3 in { Devonian clay with 10 in  
{ crinoid heads of net. 1st  
{ White limestone layer with large  
{ If this the top (1 ft thick) is the  
{ layer is wave marked, see below  
{ chert in. The top of next lower  
5 1/2 ft limestone & clay in bedded.  
7 1/2 ft well bedded chert very fossiliferous.  
16 in massive base of chert  
33 ft white chert, soft, argillaceous.  
1 1/2 ft heavy layers of chert cut out  
84 ft to base heavy layers. All sandy.  
67 ft testill clay up to exposure  
3 ft limestone small with crinoid  
9 in clay rock  
1 1/2 ft massive limestone  
18 1/2 ft shaly rock, thin bedded, 1st layer.  
6 1/2 ft Lyrus not same  
15 ft Lyrus very fine?  
10 ft Lyrus not common but not  
very common in the Devonian  
limestone elsewhere.



Photo 2D, Taken from road  
south of where road to Union City  
turns off, N. of College Hill, looking  
east across Pennsylvania  
toward Clay City

67 A. North of College Hill N. of where road  
turns off to Jackson Ferry,

17 1/2 ft Devonian upper part  
5 ft thin bedded  
5 1/2 ft thin bedded with Waco fossils  
5 1/2 ft clay no fossils noticed  
6 in limst = 2 ft layer with  
strong fossiliferous markings  
8 1/2 ft clay  
7 1/2 ft thin bedded with small and thin  
bedded, calcareous thin bedded  
limestone

{ 2 ft 6 in Penn creek clay  
3 in limst bed  
6 in clay  
6 in clay + limst bed

66 B. North of valley, N. of College Hill

1 ft thin bedded  
4 in black shale  
3 ft limst with small corals  
1 ft 3 in limst  
4 ft chert abundant  
corals

2 1/2 ft white even limst with  
10 ft light brown massive Devonian  
fossils layer Dev. species within  
2 ft of top

60

S of Waco, S side of  
stream, up hill

11 ft base of Devonian

7 1/2 ft Waco limestone

10 in 2 ft layer

13 ft bedded clay

5 1/2 ft thin bedded altern. l + cl

3 ft 6 in rather heavy bedded

6 ft interval chiefly Penn creek

2 1/2 ft Whitfordella layer

1 ft large crinoid bed in C  
rock



$\frac{1}{8}$  mi West of Tunnel W of  
Millin.

Garrard } 75  $\frac{1}{2}$  ft }  
Middle } 12  $\frac{1}{2}$  ft } 197 ft  
Lower Utica }

(Not sure?)  
rock like the Garrard =  
apparently interbedded with  
Strophomena magnifica  
5' to next iron layers with  
10' interval - same bed are?

60 ft to Marion Newby house.

5  $\frac{1}{2}$  ft to next fence.

in the section.

and Garrard in Mary-  
house and in Stroph.

8  $\frac{1}{2}$  ft to base of Garrard ss. plus

(Rough)

Base of Embury at top with  
113 feet from Catheys top to last fence.

I had no shot on the large brachiopods  
(Strophomena). Strophomena here or just  
top of layer. In the clay pebbles + debris  
for the top of Catheys = 10 ft above RR  
at first cut W. of bridge 54 and thus  
is same level as E end of bridge 54  
No Plectambonites below but on  
blatly above.

Millin, Pa.

Middle & Lower Utica section  
measured along RR with  
correcting for dips = 93  $\frac{1}{2}$   
Correct thickness = 121  $\frac{1}{2}$   
Dip = 28 ft.

Photo 3D = Base of Garrard.

7  $\frac{1}{2}$  ft up to 2nd RR crossing E of E. Millin  
Locality 87 = Base of Garrard  
12 ft up to RR cross E of E. Millin  
3 ft. up to RR cross in George Millin  
17 ft up to bridge

12 ft up to bridge 61.

10  $\frac{1}{2}$  ft up to bridge 60.

3  $\frac{1}{2}$  ft up to bridge 59.

Same elevation at Millin station  
as at W end of bridge next  
below in these notes.

2  $\frac{1}{2}$  ft up to W. end of bridge.

Bridges 56 & 57 at about same  
level as east end of Tunnel.

East end of Tunnel = about 25  $\frac{1}{2}$  ft  
above base of Utica.

Base of Tunnel = about 18 ft above  
base of Utica. West end of  
Tunnel.

Bridge 54 is about 11 ft above  
base of Utica.



# Richmond & West

16' ft. Some kind of rock as bel. nr.  
 up to RR depot at Richmond  
 22' ft. yellow bedded clay arch. Lynx  
 fairly common at base. up to  
 bridge across R.R. 1 mi. W. Richmond  
 33' ft. very rough arg. rock. Lynx not  
 especially common. Fossils rather  
 few. Finest part at T

13' ft. Very rough stone. Lynx fairly  
 common. rough like lynx  
 bed.

22' ft. Clay with fossils few, arg.  
 W occasional Lynx. rough like lynx  
 bed.

X 16' ft. Thin shaly clay, no fossils  
 look up. Fossils quite in  
 5' ft. with *Strophomena* abundant.

5' ft. beds with *Strophomena* & *Strophomena*  
 Lynx. like lynx beds.

(Resembling lynx beds)  
 5' ft. Lynx, *Strophomena* in rough  
 rock with *Strophomena* magnificum  
 or that the great bed of *Strophomena* in arg.

U 3 miles west of Richmond  
 to next locality. W. of bridge 68

22 to 27' ft. up in *Strophomena* hills  
 in *Strophomena* magnificum near next loc.

8 mi. W. of Mill Park S. of R.R. but.

28' ft. 3 across base at 2 mi. R.R.  
 crossing east of *Strophomena*  
 V 34' hills part. base of beds  
 with *Strophomena* magnificum.

Total 195 ft.

12 1/2 Catheys top.

9 3/4 Williston top Loc 87

28 Gamard top Loc 86

Stroph. top Loc U



Black sulphur water.

Same cont +

$H_2S$  in contact with air  
decompose + produce the  
black sulphur of iron;  
should be used only fresh at  
spring.

Sulphur water.

More durable = with  
iron sulphide

Chalybeate waters

Bicarbonate of iron.  
Sulphur water. Fresh at spring.

Chalybeate

Sulphate of iron

Saline water

Sodium chloride

Saline water

Sulphate chiefly

Bryle Co

No 2270 Chalybeate Mineral Water.  
Well 8 ft deep at Camp Bryle and  
near Danville junction.

2271. Old Chalybeate Spring Water.  
Alum Springs. 1/2 mile  
from junction on L & N.

2272. Phosphorus Spring at  
Alum Springs.

2273. Small basin about  
50 yds from 2270

2274. Bored well 40 ft deep, about  
150 yds from 2270.

2275 Black Sulphur Water.  
Alum Springs, 1/2 mile  
from Danville junction.

2276. Black Sulphur Water.  
Linnets well = springs,  
at Linnets Springs,  
formerly called Central  
Ry. Camp of Roads.

2277. Petroleum Springs  
well 8 ft deep at  
Alum Springs.

2278. Epzome Mineral Water.  
Falls Spring at  
Linnets Springs.



Boyle Co.

2279. Russell's Spring, at  
Finnetta Springs.

2280. Peter's Spring,  
Finnetta Springs.

2280 A. Salt well, 40 ft deep,  
300-400 yds from junction  
C & F dep. D. mine, etc.,  
and about 40 yds from  
2274

2280 B. Peter's Well, 10 ft  
deep, well at Finnetta  
Springs.

Clark Co.

2471. Magnesium sulfate well  
at Riddan's Ch. J. E. G. Davis,

2472. Oil Spring, near the  
yard, A. M. E. station.  
Ore near junction  
Columbus & B. & O. R.R.

2473. Chalky Spring, Straits  
Mill, near the top of  
the limestone.

2474. Soda Spring, at Straits  
Mill, full of soda ash.

2474 (bis) Red Sulphur  
water, C. C. E. station,  
near the yard. Black  
slate, N. W. corner.



Nr 856. Limestone on H C Pim-  
dell farm, Bullitt Co. Ken-  
n at Gap of the Roubid. Upper  
Silurian Fossils.

Nr 857. Upper Silurian.

	Nr 856	Nr 857
CaCO <sub>3</sub>	50.95	52.88
MgCO <sub>3</sub>	37.74	37.577
Al + oxides of Fe + Mn	2.70	1.640
P <sub>2</sub> O <sub>5</sub>	Trace	Trace
H <sub>2</sub> SO <sub>4</sub>	2.021	.067
Potash	.463	.270
Soda	.226	.198
Silica + insol. silicates	6.380	5.98
Water + loss	1.504	1.388

888 Limestone, some of Black  
slate, Clarke Co. Ky. The  
dense calcareous portion of  
the gray black slate, found  
also in Madison, Bath  
Pencil, Estill, etc.

CaCO <sub>3</sub>	40.280
MgCO <sub>3</sub>	15.903
Al. oxides of Fe	
and Mn + phosphates	9.460
H <sub>2</sub> SO <sub>4</sub>	1.025
Potash	.436
Soda	.164
Silica + insol. silicates	23.180
Bituminous matter	
water + loss	9.552



889. Sandstone with oil  
 from Marcellus shale  
 Oil Springs, Clarke Co. Ky.  
 dark grey l. with its cal-  
 careous spar in irregular  
 thin irregular weathered sur-  
 faces of a dull buff color.

CaCO <sub>3</sub>	56.76
MgCO <sub>3</sub>	21.302
Al. Oxidizing Fe + Mn	11.260
P <sub>2</sub> O <sub>5</sub>	.438
H <sub>2</sub> SiO <sub>4</sub>	.372
Potash	.193
Soda	.103
Silica + Insol. sol.	2.480
Bituminous matter	
Total loss	7.092

946. Clay, Pitters Clay?

4 mi. NW of Irvine in the  
 Pitters and Lawrence, Kentucky.  
 Light buff gray with streaks of  
 fine of reddish. Appears to  
 be principally fine grained  
 sand with a few minute  
 speckling a coating of mica.

Silica.	71.78
Al.	17.58
Oxide of Fe	2.420
Lime, none	
Magnesia	.547
H <sub>2</sub> SiO <sub>4</sub>	.112
Potash	2.271
Soda	.322
H <sub>2</sub> O expelled at red heat	4.400
Loss	.568

23.57 10 to 100 slaps

324 slaps

32.4	520
2.35	324
1.620	324
9.72	324
6.48	324
5280) 76.1.42 (1.44 miles	5280) 19.36.40 (.36)
5280	15840
23340	352.40
21120	316.00
22200	3.250



947.

Building stone.  
5 miles from Irvine, on the  
Richmond turnpike. Extends to

Dark grey, fine grained l.  
many small scales of mica,

CaCO <sub>3</sub>	41.380
Mg Cr <sub>2</sub>	30.019
Cont. of Fe	4.321
Oxide of Fe	2.365
Al	.806
Brown Oxide of Mn	.480
P <sub>2</sub> O <sub>5</sub>	.374
H <sub>2</sub> SO <sub>4</sub>	1.471
Ext. ash	.482
Soda	.019
Silica + insol. ash	18.620

973 Magnesian limestone  
Clinton. Hillston arg.

Dull, dirty - buff, impure l.  
with rounded beads, small scales of  
mica, + brownish at bottom of  
beds of iron.

973	
Ca CO <sub>3</sub> = 42.680	71.700
Mg CO <sub>2</sub> = 25.358	9.931
Fe CO <sub>3</sub> 5.155	
Mn Cr <sub>2</sub> .421	
Oxide of Fe = 11.073	12.24
Al 1.080	al.
P <sub>2</sub> O <sub>5</sub> .848	.630
H <sub>2</sub> SO <sub>4</sub> .324	.337
Ext. ash .290	.341
Soda .033	.139
Silica + insol. 10.550	2.68
Fe + Cr <sub>2</sub> 1.858	1.802

No 674. Yellow Red Porous rock,  
on horizontal bed. 1 1/2 mi  
E of Mt. Carmel, Lebanon Co.



1068 Banded Building Stone,  
75 ft. above Dean Martin  
West of Grant house at  
Greenville Ky.  
= Madison bed.

	1068	1069.
CaCO <sub>3</sub>	45,880	26,88
MgCO <sub>3</sub>	22,911	1,687
Al. Oxide & Fe. & Mn.	5,760	7,260
P <sub>2</sub> O <sub>5</sub>	220	.694
H <sub>2</sub> SO <sub>4</sub>	1269	.406
P <sub>2</sub> A <sub>2</sub> O <sub>3</sub>	347	.965
Soda	372	.012
Silica residue including residue of Cark. of Soda	3.00	silica 59.90
Insol. silica	18,520	
H <sub>2</sub> O + loss	2,721.	2,196

1069 Marl from Chenoweth creek  
Jefferson Co. Ky. Greenish  
grey, clay like substance.

1083. Saline efflorescence on  
copperas from Desman  
Black slate, near David  
Whitford, 8 mi from Clark-  
burg, Lewis Co. Ky.  
Yellowish-white.

Salts of Al.	25,585
" of Fe	15,653
" of Mg	1,000
" of Alkaline Sulfat.	8,000
Slate (Impurities) + insoluble parts	1,000
H <sub>2</sub> O + loss	48,762



No 1085

Yellow Magnesian limestone,  
upper Silurian, Salt Creek  
creek, 4 miles above Clark-  
son, Lewis Co. Ky.  
Base of buff porous l.  
Full of small pits. Ex-  
posed surface so soft as to  
be scratched by a nail.

1086. Sandstone of limestone  
at  
fork of Salt Creek creek,  
Adrian, Hamilton Co. Tenn.  
Lewis Co. 1085

	1085	1086
Calc of Ca	55.240	Trace
" Mg	27.820	.732
Al. Oxid Fe & Mn	12.280	5.800
P2O5	.207	.118
H2O	.152	.200
Potash	.167	Trace
Silica	.126	Trace
Silica & insol. mat.	2.580	90.920
H2O & loss	1.428	2.230

1122. Potter's clay near Walco,

1123. Magnesian limestone,  
good building stone, from  
Mr. Crockett's farm, Madison  
Co.

1124. Black shale, flints of Mad-  
ison Co.

	1122	1123	1124
Silica	62.58		Sand + sil. = 63.120
Al.	21.98	al. with Fe + Mn, 29.60	8.560
Oxide of Fe	4.78		
Calcine	Trace	Calc. 30.729	Calc. Ca 11.180
Magnesia	1.76		2.034
Oxide of Mn & Fe			
P2O5	Trace	.271	.143
H2O	.234	.509	.1653
Potash	2.697	.374	1.303
Silica	.500	.058	
H2O as expelled		14.180	Bitum. matter + H2O = 12.00
at red heat	6.140	1.599	



Lynx beds near edge of Main  
+ Fleming Crs.

1181, 1132, 1133

1131 1132 1133

CWC 83	75.44	87.94	77.36
WJ 83	4.283	1.721	2.307
Al. Cap. F. M.	3.751	2.200	3.910
Pauls	.409	.348	.310
H. J. 84	.474	.373	2.423 (F)
St. Paul	.540	.289	.424
Gravel	.292	.047	.068
S. H. 84 + 85	14.44	6.38	13.98
Grass		.663	.666

Nebraska Co

Magnum's Limestone,  
1165 B in distance, green grey.  
1166 Rolling Fork, Upper Sil.  
1167 Mr. Troutman's building  
St. Paul, Nebraska Co.



Is most one from the Turraforte  
head of Mill Creek.

Ca Lvs	93.98
Mg Lvs	2.797
Al. Br of Food Mtn	.264
Or Lvs	.054
Hed Lvs	.338
Pink Lvs	.189
Soda	None
Subtotal	3.040

Scotts Hill, in Trimble Co.

~~Stems blackish red &  
Rhynchospora capax. Stipe  
pubescent. Stipe also  
white. Bractea subtendens  
acute. + Much more  
mottled white. Found in Little  
Kentucky River.~~

Carroll C.

He can tell you where New York  
is. Dangerous to him or death  
+ Stupid. All your friends.

$$\begin{array}{r} 970 \\ 235 \\ \hline 3850 \end{array}$$

$$\begin{array}{r} 2310 \\ 1540 \\ \hline 3850 \end{array}$$

$$\begin{array}{r} 180750 \\ 15440 \\ \hline 22550 \\ 21120 \\ \hline 14300 \end{array}$$

$$\begin{array}{r} 340 \\ 151520 \\ \hline 493 \end{array}$$

$$\begin{array}{r} 235 \\ 1700 \\ 1020 \\ 680 \\ \hline 27100 \\ 26400 \\ \hline 7000 \end{array}$$



Road to Raywick,  
 Col. J. B. Wathen,  $1\frac{3}{4}$  mi. west  
 of center of Lebanon,  $\frac{1}{8}$  mi. West of  
 where road turns off south,  
 N20°W from house to gully or  
 gullied run, near lower part  
 of which, 62 feet below the level  
 of the house, is found a top of  
 Platy stroph. a lynx range.  
 About 5 to 10 ft below this occur  
 Rhynchotrema dentatum, and  
 2 feet lower is found Loph. arena  
 re multivalis. The creek must  
 be nearly 10 feet lower, but  
 this was not measured.

Rhynchotrema dentatum  
 was found also in R.R.  
 cut on N side of the  
 railroad NW of this  
 locality. M. F. Paley,

340 steps to forks of road 77) 340 (4.4 x 11 =  
 308 4.4  
 32 4.4  
 2.7 of 48 ft 48.4  
 11 0  
 Total dip = 58 ft

16 ft from fence up to large log house

Angle C Brown,  $2\frac{1}{4}$  miles about  
 from C road to mine in Lebanon, direct  
 by opposite the circular Devonian  
 mentioned below.

45 ft { Circular light grey Devonian l.  
 37 ft Pseudo-Madison. Clay shale bedded  
 4 ft rock full of fossils including Praeferens Richmond.  
 1/2 ft clay shale.  
 Praeferens  
 3 1/2 ft clay shale.  
 Top of range of Pl. lynx.

41 ft Underlying Black Shale with  
 large Rhynchotrema along road.

at F. W. Darty's road  
 a dip of 11 ft to 77 steps N  
 77) 770 steps (10 x 11 = 110 ft dip)

Up a gully SE of Ben Darty, E of  
 highest part of hill S of house.

25 ft to top of hill. Devonian chert here  
 and down to next point = 100 ft.  
 143 ft up to Platy stroph. a lynx range.  
 5 1/2 ft white l. Rafinesquina  
 5 1/2 ft blue l.  
 5 1/2 ft blue l. with Stroph. + Pl. lynx,  
 5 1/2 ft up to Stroph. range in blue limestone  
 5 1/2 ft creep up to Stroph. limestone range in  
 in blue limestone.



*Rhynchotrema dentatum*,  
about 1 mile south of  
Mud Is., on east side  
of Carey creek, and  
is side of a branch empty-  
ing into Carey creek,  
at top of a hill, and  
probably 1/2 of a mile  
from mouth of a branch.

A cabin is situated op-  
posite the locality on the  
N. side of the branch,  
and a house is on the  
head of the branch.

Fossils found on top of  
a ridge that extends  
between the branch and  
a branch which is larger  
and further south.

Thin locality is south of  
the locality where Den,  
from which great  
abundance but few

*L. ...* are found  
with these.

associated with *Rh. dentatum*  
= extended form of *Pl. lynch*,  
also *Pl. aculeata*.

W F Pate.

Linney, on Nelson near Blom-  
field. W F Pate saw  
some specimens near  
Blomfield.

P *Leptaena rhomboidalis*,  
about 1 1/2 mi. S E of  
Camillus Ga. also,  
which is about 4 miles  
from Leptaena on the  
D. cross the river. Turn  
along a country road  
S E, and 1 1/2 mi. down  
that road turn sharply  
to left, crosses a branch  
1/4 mi. to the branch  
at the road crossing.  
Found on S side of a  
little branch emptying  
into big branch from  
E.

*Shephersonia sulcata* at  
ditch along in B. on B. road  
turn road, about 1 mi. W  
of B. and St. Ann. At foot  
of long hill 4 mi E of  
B. and St. Ann. on Springfield  
Jct. At top of long hill  
on R.R. west of B. each fork,  
from Springfield to B. and St. Ann.



*Orthis longirostris* *linneyi*  
2 1/2 mi (E) on pike  
which runs down the  
RR from Springfield  
toward Bandolier.  
The stream to the W of  
the pike is near the RR.  
Lying just E of said RR.  
The RR cut can be seen  
clearly from the pike, and  
a large tree stand on  
the west of the pike. There  
is a water gate near the  
express.

*Beatrixia* (*californica*?)  
in quarry as you go  
down the hill to bridge  
over Rolling Fork,  
on the road to Bandolier  
from Lebanon. On  
N side of road, before  
reaching Rolling Fork, 1  
mile from Poplar Creek.

*Beatrixia* may be the head  
waters of *Atkins Creek*.  
Not on creek but on  
one of the branches.  
*Heterospira* in the

*Trematopora quadruplicata* *sch*  
W. F. Pate thinks that  
I said to have been a  
form from near Paris.

*Trematopora quadruplicata*  
Pate thinks he has a  
specimen.

*Cerithium* *claytoni* 18-40 feet above  
the Birdseye Millville  
in Woodford County.  
The first Pike leaves the  
old Cross pike in the  
bottom of a branch 200  
yds from intersection  
with the old Cross pike.  
Hundreds of fine spec  
are found in very thin  
clay layers.  
at old reservoir just beyond  
the park and E of Peak,  
Mill pike, near Frank  
fork.  
Found almost everywhere  
at this horizon.



R D Murrell, on Caney Creek  
road. From here .144 miles  
north to main exposure of  
which is believed to be lowest  
rock along creek. Clayey rock  
with interbedded limestone  
containing *Stroph. maynillensis*.

R D Murrell = .367 miles from  
forks of Caney creek north of L. m.

From Forks of road = .151 miles <sup>N</sup> to  
base of shallow gully where I made  
my section.

From Forks of road = .493 miles to  
next fork of road northward, 10 ft  
rise of road.

From R D Murrell to forks of  
road where R. M. T. road +  
Bentonian road meet = .860 miles.

12 ft from lowest exposure at Forks  
of Caney Creek. R D Murrell to  
top of its gray clay bedded layers,  
16 ft further up to base of gully  
section = 28 ft from lowest  
point where section exposed at  
fork of road N of R D Murrell to  
base of gully section.

22 ft rise of road gully section to  
next fork northward. Dip angle cal-  
culated at 110 ft. Total = 132 ft, from  
gully to forks of road.

286 ft measured with out regard to dip  
from forks of road to top of  
beds with *Pl. lymex*. From here  
to nodules at top of fossilifer-  
ous base of Richmond = 8 ft  
more, total = 34 ft.  
Dip calculated at 13 ft. Grand  
total = 47 ft = Forks to nodules

182 ft foot of gully to forks  
179 ft foot of gully to nodules  
Calculation  
170 ft measured vertically

The top of the Warren, for about 20 ft,  
is rather soft clay rock. The  
next lower part is the hard,  
dense blue clay limestone  
containing great masses,  
with veins, etc., which form  
the fossils, which occur in the  
beds, which occur in the  
at Wood's etc, and beneath  
the Devonian rubble.

41 ft thickness of Black Shale



- 826 Paris  
 794 Miller's bay  
 842 Cross bedded heavy l. in Catheys  
 810 Cross bedded l. in the gutter  
 826 Corbale  
 845 Clit in limestones  
 860 Tunnel  
 810 Base of massive Middle Eden  
 765 Top of Catheys  
 660 Myers  
 Parker Hill  
 Bridge over Yorking  
 Top of Catheys  
 Pleasant Valley  
 Tunnel  
 Tunnel  
 885 Canyon  
 845 Spring  
 55 West on  
 52 Johnson  
 55 The Lena  
 20 Mill Creek  
 8 Marshall  
 735 Bridge  
 802 Summit

S. plan

57 ft on a dried valve  
 ← (Dolomitic gypsa, 1 specimen)  
 11 ft clay & limestone. 8 or 10 ft  
 8 1/2 ft Limestone with lignite. Are there any  
 (Mt. Carbon?)  
 22 ft poorly exposed, partially l & cl.  
 river  
 Lignite beds along the river  
 The water is shallow over the  
 at 50 ft. This appears to be  
 24 ft of limestone, coarse grained, lignitic  
 25 ft thin lignite but strongly laminated  
 8 ft typical lignite common up to  
 this level above the river.



First cut W of Pendleton Station  
Banded Madison.

First cut E of Pendleton Station  
Well bedded clay rock with  
conchoidal fracture. Cut  
runs N + S. Fine for sh.  
Dip slightly. At lower end of  
cut there is well bedded sandy  
clay rock with fossils very  
few and poor. W-sign

2nd cut E of Pendleton, Thin clayey  
layers with badly weathered  
thin limestone with *Streptelasma*  
ma. Fossils very poor. At E  
end of cut is massive 2 foot  
layer of blue limestone  
with *Streptelasma*, *Platanolites*,  
*Platanolites*.

3rd exposure E side of RR cut on  
Tetradium, *Trilobites* 6 spec.  
Large *Leptæna* + *Alveola* just  
below this 2 foot limestone.  
About 5 ft below the 2 ft layer  
of limestone about 12 specimens  
of *Leptæna* + *Alveola* were  
found.

4th cut from Pendleton shows  
*Leptæna*

5th cut shows *Leptæna* + *Columnaria*  
near base of W-sign

The *Columnaria* has the septa  
curving close to the centre and  
therefore may be *alveolata* but  
the cells are large and it may  
be a new species. Resembles  
*Leptæna* specimen. *Columnaria*  
near base of W-sign. See section  
south of Salt River for this  
limestone. The *Leptæna* is  
very large, some specimens  
3 in in diameter.

Top of *Leptæna* - cut E of house  
on left of road.

*Leptæna* *Madison* 2/3 of top of  
next cut. *Dischidites* or *Leptæna* further down.

*Leptæna* common at next little  
cut in limestone at top of cut.  
In next cut *Leptæna* + *Alveola* and  
above. *Dischidites* or *Leptæna* occurs  
just above this limestone. The  
*Leptæna* is abundant in this.  
preceding cut occurred at least  
6 ft higher up.



Pendleton. Going out.  
Base of Morrison section.

(spalling clay)

1 ft Well bedded, rather thin bedded.

2 ft Intermediate stage of fossiliferous (and some fossil)

Cont. some *Strophomena* in middle part, but much decayed.

1 ft 6 in. *Strophomena* in lower part bedded, some fine, fossil.

17 ft by a clear increase in fossils.

Common, also *Strophomena planumbona*.

1 1/2 ft Well bedded, with *Strophomena*

1 ft 6 in. *Strophomena* = Bull Creek section

5 ft Clay with *Leptaena*, *Leptaena*, *Leptaena*.

← 3 ft 6 in. *Leptaena* horizon

1 ft 6 in. *Leptaena*

13 ft *Leptaena* in clay shale weathering

4 ft Clay shale, some *Leptaena* spalling.

4 ft *Leptaena* and *Strophomena* in clay shale.

7 ft Clay shale.

3 1/2 ft Darker clay interbedded with clay shale.

5 ft Light greenish gray clay.

1 1/2 ft *Leptaena* chiefly in lower part

1 ft 6 in. *Leptaena* horizon.

with *Leptaena*, *Leptaena*, *Leptaena*.

2 1/2 ft Up to *Leptaena* layer, associated

Leptaena but is not a *Leptaena*.

5 1/2 ft (very clayey, corresponds to nodular

type)

blue limestone of typical Warren

22 ft up to top of fossiliferous clayey

6 ft up to one *Leptaena* in clay shale.

2 ft up to *Leptaena* *Leptaena*, excellent spec.

*Leptaena* common in lower part.

Pendleton = page 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

section.

James Richardson.

needs a good clay.

Don't think, No layer.







Pendleton. Going East.  
Base of massive Madison.

(spalling clay)

8 ft { Well bedded, rather thin bedded

2 ft { Intermediate layers, *Desorbis* form *Nebula*  
and *Amor* fossils

Contains *Strophomena* in middle

part, but much decayed.

if *Desorbis* is right, in lower

thin bedded limestone, fossil.

17 ft by a clear micaceous part.

Common, also *Strophomena* abundant.

1 1/2 ft { Massive, with *Strophomena*

{ *Wanda*, *Tetradium* = *Ball Creek* section

5 ft { Clay with *Lissopora*, *crispiformis*,

← *Strophomena*, *Leptæna* horizon

in a clay bubble

13 ft { *Strophomena* in clay rock weathering

4 ft { Clay rock, from clay spalling.

{ *Præspira*, small *Strophomena* *asymmetra*

4 ft { Dark clay in clay rock, *Leptæna*, *Lange*

7 ft. Clay rock.

3 1/2 ft { Darker clay interbedded with clay rock

5 ft { Light greenish gray clay.

1 1/2 ft { *Columnaria*, chiefly in lower part

{ Thickening of *Columnaria* horizon.

{ with *Leptæna*, large *Præspira*

2 1/2 ft { up to *Columnaria* layer, associated

{ layers but is not regular.

5 1/2 ft { very clayey. Corresponds to nodular

{ type

22 ft { blue limestone of typical Warren

{ up to top of fossiliferous clayey

6 ft { up to one strong *Leptæna* in clay shale,

2 ft { up to *Desorbis* *retrocurva*, excellent spec.

*Leptæna* common in limestone.

Pendleton = page 17,  
Massive Madison Not measured

More clayey Madison.

23 ft.  
Corrected.

Fossiliferous Richmond.

18 1/2 ft  
corrected  
for dip

51 ft  
not corrected

28 ft. possibly needs correcting.

2 in. or there, No layers.



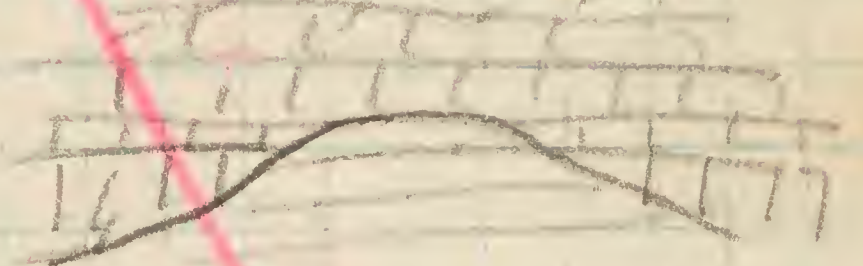
# H.C. Black. Bedford, Ky.

On S side of Corn Creek, about 4 miles from Bedford. Fine exposure from top of Madison overlaid by residual Silurian. Shale down to fossiliferous thin laminated clay with *Platystrophia*, *Strophomena*, *Din. subquadrata*, *Plect. sericea*, *Com. Stroph. retorta*. 68 ft from creek to base of Clinton, 74 1/2 ft to top of local bed. 16 ft to top of ridge, succeeded by shale, Labeled limestone well exposed farther north. Transfer Geopark only a little over 1/2 mile farther north. Half a mile farther north, on the S side of the north fork of Corn Creek, the Madison rock is well exposed on the east side of the road, exposure about N + S. 5 1/2 miles to Bedford.

27 1/2 ft from creek with *Stroph. retorta* to base of massive Madison. 32 ft more to top of massive shale. 5 ft of local bed. Good west to east to bed of Clinton partly exposed.

27 1/2 ft to first lens of Lenoir, but the base of the Lenoir may occur below this 70 ft to top of ridge, but no exposures.

5 ft. Clinton like rock. 1 foot additional rock at base resembling the same. Beneath that is undoubted Madison. Unconformable contact between base of Clinton + top of Madison so that within 15 ft the thickness of the Clinton is about 3 1/2 feet, the lower part being gone, where there was an elevation in the Madison.



Distance with rock = 24 ft. bed no rock layer containing *Stroph.*, probably *Concordensis*, looks very much like good ventral valve of this species, also several small *Dalmanella* *guyosa*, like form formerly considered typical. 11 ft above this to the *Gingulca*, not listed. The rock here is



nodular sand resembles that  
 I saw in the lower Warren.  
 No *Dalmanella* seen. 5 1/2 ft  
 up the layer looks like Warren  
 with *Rafinesquina*, *Ref.*, *Ref.*,  
 7 ft further up *Dalmanella*  
 abundant and in rather thin beds.  
 At one place, formerly called  
 base of Richmond, *Leptaena*  
*rhomboidalis* was found  
 2 ft lower in layer with plant  
 & *Rafinesquina* against upper  
 edge. By this I mean  
 lower than *Dinorthis refracta*.  
*Rafinesquina* layer in same level  
 as edge.

No corals noticed at base of  
 Madison at either of lower  
 creek crossings where the  
 road was good, or even in  
 the creek down to Millton.  
 Opposite W. H. Bartlett's house  
 is a gully and at head of  
 this gully, where the bridge  
 is the *Dinorthis refracta*  
 locality. *Dinorthis refracta*  
 horizon is 2 ft 9 in. thick.  
 Kendall's branch.

Williams. Ann. Sci. Vol. VI.  
 p. 328. Believing Black shale  
 sediment was derived from  
 1897 *Lincolniensis* plant and animal  
 the black shale at top of  
 lower Carboniferous and middle  
 Carboniferous fossils which  
 at the same period can  
 Appalachians side of  
 Cumberland and Chesapeake. These  
 were sediments of a differ-  
 ent character.

George H. Girty

1898. Old Springs, in Guilford  
 Creek 2 mi SE of Indian  
 Fields, Clark Co. Ky.  
*Leptaena* (*Leptaena* sp.) Williams  
*Rafinesquina* sp.

*Leptaena* *Leptaena* *Leptaena*  
*Leptaena* *Leptaena* *Leptaena*  
*Leptaena* *Leptaena* *Leptaena*  
*Leptaena* *Leptaena* *Leptaena*

7 *Dalmanella* abundant.  
*Strophomena* *Strophomena* *Strophomena*  
*Leptaena* 11 ft nodular.  
*Leptaena* 2 ft  
*Leptaena* *Leptaena* *Leptaena*



2 mi. S.W. of Jeffersonville,  
Vinton, Perry Co.,

*Strophomena williamsi*

*Orthis vindex* sp.

*Gervillia quadrilateralis*

? *Strophomena*, cf. *Haskinsii*,  
1 full

with? *Pleth. apica* *reticulata*, n. sp.

*Strophomena* *lurida*,  
Damon?

*Strophomena* *reticulata*,  
Berea, Ky., Vinton, Ky.,

= *Strophomena* *spatulata*, p. 100.

V. *maxima*

*Palaeozoic Fauna of the Ohio*,  
Vol. XVII. *Strophomena*.

*Annals of the New York Acad-*  
*emy of Science*.

I suspect they represented a  
single entire *Strophomena* as  
yet under which 1889.

*Trans. N.Y. Acad. Science*,  
Vol. XVI. p. 282-304.  
Bathurst Damon.



Bored Well. Jefferson town East.

M. E. Kline's Place.

Silicic Acid	8.381
Calcium Sulphate	26.042
Magnesium Sulphate	61.700
Calcium Bicarbonate	89.635
Sodium Chloride	559.352
Magnesium Bicarbonate	17.956
Sodium Sulphate	1.194
Potassium Sulphate	.324
Calcium Nitrate	.255
Manganese Bicarbonate	Trace
Sodium Borate	Trace
Sulphuretted Hydrogen Gas	1.566
Iron Bicarbonate	1.003
Alumina	2.053
Sodium Phosphate	Trace
Bromide and Iodides	Trace
Free Carbonic Acid Gas	6.960
Lithia	None
Organic Matter	None
Total Solids	756.420



Barren Hill Creek, SE of Jefferson-  
town.

- 605 *Stroph. retorta*  
Stroph. very robust.  
Protocera common.  
606 *Bry. sp.* *Sarcocolla*  
593 *Grapt. bed* with *Stroph. retorta*  
*Heterocera* + *Platythra* common.

On pipe to Fishersville.

- 675 Top of *Stroph. retorta* zone.  
645 Top of *Columnaria halli*, in mass. 15 in-  
ches thick. *Stroph. retorta* zone.  
625 *Massive clay rock* - top, with  
*Prasopora hospitalis*.  
586 *Columnaria alberta*  
*Tetradium* in clay rock contain-  
ing many *Prasopora hospitalis* 577  
576 Top of *retorta* & *Platythra*.  
570 Level of highest *Stroph. retorta*  
lynx seen. Must be in Warren  
bed?  
540 Floyd's creek bed.

Half mile west of Fishersville, along P.R.  
on west end of road.

- Platythra lynx*. Abundant.  
*Lophocera rhomboidalis*. Abundant.  
*Platythra dentata* 15 sp.  
*Amm. scabina* large.  
No *Platythra* miles seen.  
Some of the *Pl. lynx* specimens are ab-  
undant along the level of the *Stroph. retorta*  
*rhomboidalis* zone, abundant.  
*Tetradium* = large *Ammonia* type.  
*Columnaria* *retorta*, rather small.  
*Columnaria* *retorta*, full size.  
*Dalmanella* *retorta*, very large.  
*Isotelus* *retorta*, small specimens.  
*D. retorta* *retorta*, 3 good specimens.  
at base of *retorta* zone, at base  
and of series of *retorta* in *retorta*  
level = 74 mi. west of Fishersville.  
Large *Columnaria alberta* - large cells  
most large cracks, near base of  
Floyd's creek, just east of  
Floyd's creek bridge.  
W. of Floyd's bridge.  
at base of *retorta* zone, at top of heavy bed.  
covered by heavy limestone rubble  
full of fossils in the *retorta*  
*Stroph. retorta*, small.  
*Heterocera*  
*Platythra*  
*Stroph. retorta* *retorta* *retorta*  
*Stroph. retorta* *retorta* *retorta*



about 13 feet up is *Columbianella*  
*halli*, forming beds. The name-  
 ment not very exact on account  
 of dip.

Section post 24

West of post 24 = white clayey fossiliferous  
 one section with, = section = 13 ft. not exact

- x *Protarea retusa* common
- x *Stroph. p. punctata* common
- x *Plectambonites sericeus*
- x *Hebertella* (small) median depth  
 seen beyond middle of shell and  
 extending very slightly to front,

- x *Stroph. planus* small
- x *Stroph. ovatus* (retusa type)
- x *Plectambonites* common not *sericeus*
- x *Dinorthis subquadrata*

- x *Stroph. subcylindrica*
- Plectambonites* capax, go. form form.
- x *Stroph. ovatus* large, straight, thin

White nodular small calcareous rubble  
 5 1/2 ft. at top of Middle Richmond  
 section.

West of R.R. crossing sign board is  
 more white clay with  
*Stroph. ovatus* retusa,  
*Stroph. planus* large.

25 ft. thin bedded Madison sand thick near  
 not known on account of dip for

12 1/2 ft. Mass. Madison (uncovered)

3 1/2 ft. fossiliferous Hilly road bed, thin bedded  
 3 1/2 ft. Top of Madison section. Massive  
 1 ft. Clinton *Hedysites* *catenulatus*,  
 small tubes.

*Hedysites catenulatus*.  
 Overhead bridge on road to Potts  
 farm. Homestead.

Miss Liddy Moody, home on  
 Clinton at R.R. = 715 ft. judging  
 from level on bridge. = 200 east of  
 Hilly road to R.R.

Upper part massive. 11 ft. some  
 seen 1 mi. east of Tucker.  
 Oxford clay in front cut west.

Clinton top in bottom of gully, in right

19 ft. Lower Oxford clay  
 5 1/2 ft. Oxford limestone of lower level  
 3 1/2 ft. Upper Oxford clay.  
 14 ft. of sand with irregularly bedded  
 beds with calcareous crystalline  
 and into numerous layers of white  
 rounded in mass, rock below it

17 in.  
 7 in.  
 15 in.  
 3 in.  
 11 in.  
 5 in.  
 22 in. = { 10 x acting double ledge  
 12

Overlying layers weathered yellowish.

Photo 1-E. F. Tucker on N. side of R.R.



Contact between Capron & Clinton  
just east of point 21. — 662 ft.  
Good exposure of almost full  
Capron section beneath overhead  
bridge. Less than half a mile  
east of street crossing Clinch  
all from NE, 1 mi. West of Tucker.

Next cut west, west of Long hill, where  
RR curves northward. There is only  
massive banded Madison. But  
good clay is exposed N of RR,  
about RR bank level = 1 mi East  
of Jeffersonville.

Tucker, J. W. Describes location  
of prominent buildings.

695 Jeffersonville. 7 A.M.

555 Fisherville

655 Charles.

742 Smith east of Leachdale

734 Leachdale

715 Gorges

722 RR crossing

715 Eleventh St.

700 Shelbyville. 8 A.M.

702. Shelbyville. Striped. *Mayanthea*, common.

*Dalmanella emacrata* common.

At bridge and across Clinch Creek.

790 Road corner 1 mi E of Shelbyville.

805 J. A. Matthews' mail box. — highest.

point in road. Striped. *Mayanthea*.

common, *Dalmanella emacrata* common.

Calliper road 2 1/2 mi. East of

Shelbyville. *Crustacea* common.

760 Heavy limestone layers, down to 760

with *Strophomena mayanthea*. Interbedded

with sandy limestone and layers

down to 745 at least. Also *Crustacea*

common.

735 In front of E. Pinkston, same fossils as

above, in place of coarse grained limestone

Striped layers. *Crustacea* etc.

730. Just east of E. Pinkston. Limestone

with plenty of small *Dalmanella*

*emacrata* & a few *Strophomena*

*mayanthea*.

Below this level *Dalmanella emacrata* is

very abundant in coarse limestone, interbed-

ded with sandy limestone and thin beds. Striped

*mayanthea* few but present. Platy-

stratified layers of *Strophomena* and *Strophomena*

small. *Dalmanella emacrata* small.



702 Bridge level across Grist creek, 9th  
A.M.

Section at Grist creek

6 ft up to lowest *Stroph. mayanillensis*  
13 ft up to bridge level, base of *Holthofer*  
9 1/2 ft to top of heavy l. with *D. emacrat.*  
Grist creek level \ abundant.

690 Base of Mt Hope at Grist bridge.

722 Bridge over Grist creek at 10, 15

770 S.V.S. block. First source E of bridge

740 At bridge over branch of Grist creek,  
4 mi E of Shelbyville.

726 To top of heavy rock, 2 ft thick, like  
that considered at base of Mt Hope  
at bridge over Grist creek,  
best good *Stroph. mayanillensis*  
occurs beneath, but high at base.

850 *Plat. bygon* abundant up to this level.

860 Compactly, irregularly sec-  
tion since last record, a sand,  
appearing, up to R. A. Jamison,  
about 1 mi. West of Clay village, west  
of deep valley of branch of Ticks creek,  
4 3/4 mi East of Shelbyville.

847 Just before reaching south end  
of sharp turn in road, 3/4 mi W.  
of Clay village.

805 Same as last but up bend.

815 ft *Plat. bygon* very fine, but large

(17 ft up to bridge. 1/2 mi W of Clay village.  
Creek level at bridge, with *Stroph.*  
*mayanillensis* 5 ft above creek,  
in layers full of *bygon* and  
few *Stroph. mayanillensis*.  
*Dalmanella* noticed but only  
short search made here.

This must be near upper part of  
Farm out where *Pl. bygon* and  
*Stroph. mayanillensis* come close  
together.

875 road corner in Clay village at 12, 15

888. *Plat. bygon* layers,  
*Perrinites dentatum*, *Robertsoni*  
is this. Followed by *Stroph.*  
nodular rubble.

945. Apparently the same *Plat. bygon* layers  
as at 888. There appears to be a  
northward dip equal to that of the  
road. Then a low and bottom of hill,  
Then there is a little crossing the road  
with strike N 25 E, and dip 20 East.  
This rock contains a *Stroph. mayanillensis*.

985. Strongly bedded thick layer of  
limestone full of *Dalmanella*  
*emacrat.* and *Stroph.* the lower  
beds are at a distance above and not  
first considered as being of Mt  
Hope bed.

1015. Sandy Grist creek looking rock with  
limestone layers with *Dal. emacrat.*  
= top of first side.



A slight sag in road of 15 ft feet in  
 sand, side of which is *Hedostella*  
 with *Strophomena* showing in it =  
 ? 1 chms. light small *Stroph.* Can aden-  
 - = (Bird on road). Therefore of fault  
 here. South of ledge, chert rubble  
 appears. Possibly *Adiantum* stuff banded  
 here. Don't know.

1040 ft. Same sandy sand and stuff as  
 up to last locality but the thin  
 limestone layers here show  
*Stroph.* and *Adiantum* as well as  
*Dalmanella emacrata*. - not 11 ft.

1085 up to ledge of *Georg. Butleri* fossil in  
 east side of road. Exposure chiefly  
 a layer of stuff like fossils seen.

1112 At top of first ridge where  
 road drops again. The chert  
 here appears to have dropped  
 less and still to be bedded  
 in residual clay.

1085 Drop to this level. No outcrop.

1130 To top of next ridge. No outcrop.  
 Low chert abundant for last  
 half mile along road. *Madison* in

1055 To this point the road continues  
 as a wave road. At 4th wave west  
 part there is exposure of rock  
 striking about N 75 E and dipping  
 80 N. Is this road's rock.

Following road west and west,  
 the exposure is more pronounced  
 like *Strophomena* layers. No *Adiantum* can  
 be seen here.

Part of the same general material  
 shows up along the main valley  
 road going southward, rising  
 eastward chiefly. It is difficult to  
 tell what is dip and what is slope  
 due to shewing.

1070 When road turned down = plenty of  
 the *Madison* like rock. along the road  
 going down. Here a by road turns off  
 up hill toward the west. This  
 is a *Madison* like rock probably is the  
 E and W sandstone. It shows up to

1108. Below this level there is limestone  
 in a sandy thin rock. The limestone  
 is not *Adiantum* *Leptaena* abundant  
 and *Dalmanella emacrata* a few.  
*Favosites* seen. Still the limestone  
 contains millions of minute cal-  
 careous beads.

950. Road turns NW to the west.  
 To this point the rock shows  
 3 miles back along the road  
 from first exposure where the side  
 road turns west up hill. at 1070.

935 Rock very brecciated appearing here.  
*Dalmanella emacrata*. *Platystrophia*  
*arctica*.

920 J. C. Hallman.  
 Along the road, the main *Stellman*  
 is one and a half miles in *Platystrophia*  
*kyux*, large, in the road way.  
 A about half mile farther to the  
*Madison* like rock again and above



870. in short distance south of  
born (Middleboro) along the  
road a thick blue limestone  
with *Streptelasma* & *Pachyma*  
*Streptelasma* more prominent than com-  
mon.

890 a quarter of a mile S of Middleboro  
*Platystrophia* is abundant,  
Further south is collected rock  
a vein with *Streptelasma* and  
other, further south is rock  
striking about E & W & dipping  
fully 40° degrees North. *Streptelasma*  
retent & *Pachyma* retent.

840 Here I turn off from creek road  
toward Wrentham.

752 Hemp Ridge

750 Shady Side. Barometer approx-  
imately changed but slightly  
today.

Where Pike Lake crosses road  
from Tucker to Middleboro, Shady Side  
at 655 about

5 ft Upper Bogard limestone

3 1/2 ft Upper Bogard clay

Bare of main Laurel bed

at John Wilson's house corner 662

at Nathan & Wain's Road corner 758

Lower Laurel

Upper Bogard clay

5 1/2 ft Upper Bogard l.

19 ft Lower Bogard clay

18 in clay, salmon brown

H. E. bed

Shady Side, East end of Middle  
town hill, west of East boundary

3 ft Upper Bogard clay

6 ft Upper Bogard limestone  
Lower Bogard clay

1 1/2 ft Lower Bogard

Edgar Cox quarry, 1 1/2 miles East of  
Andover on C & O R.R.

Forville has only 4 ft of clay

12 ft Walden clay, measured

23 1/2 ft Laurel rock exposed above water

10 1/2 ft shows up east of the quarry & the  
clay rock exposed

The creek toll for building & maintenance  
about \$15,000 per year for the town.

17 ft of rock bed in Walden  
is good building material  
rest is waste



Nearly 4 miles NE of La Grange on L+NR  
 { and including rough  
 { Rest of Laurel section with the bedded  
 2' 4" { some rock as at base of quarry E of Grange  
 Well bedded, 3-4 inch courses, apparently  
 3' - { Asford clay upper. Part 4, 5, 6.  
 7' 6" { Asford limestone. Photos 2 & 3.  
 { dip + measurements both  
 23' 6" { From the top of clay, estimated from  
 10' 6" Clinton  
 10' Transition  
 Madison

About 2 mi NE of La Grange on L+NR  
 Railroad to 1 mile NE of La  
 Grange.

Near La Grange Clinton is seen  
 at the same level as road of RR. =  
 1 mile NE of La Grange.

Further N is seen Asford clay  
 Asford limestone and upper  
 Asford clay. The top of lower Asford  
 is at about the elevation where Madison

clay should come in and is  
 from 200 to 300 feet further NE. Hence  
 there must be a fault in the  
 country here with a throw of about  
 45 feet.

The fine spring on road of RR is  
 from beneath Asford limestone.

La Grange 8 mi. to Westport, pike.  
 Boulevard by Mr. Hitt.

East of La Grange, on South side of  
 RR bed, at quarries 1/4 mi out  
 of town.

12 in } Clinton. Perad ballast.  
 18 in }  
 18 in } Transition. Building Rock.  
 18 in }

Saluda bed is quarried  
 also at this point.

Massive Saluda is quarried  
 also 1/2 mi North of La  
 Grange, east of pike.

Charles Runley's quarry at SW edge of  
 Jefferson town. Makes lower Laurel.

J.W. Black quarry, 1/2 mi SW of  
 Jefferson town. Makes upper  
 part of Laurel rock,  
 especially the layers.

8 in chs.  
 11 inches  
 10 in chs.  
 8 in chs.  
 16 in chs.  
 8 in  
 8 in  
 8 in

711  
 72  
 639

Level of Clinton directly south of  
 Jefferson town. = 639 ft



Concord Ky.

Clinton base.

48 ft Upper Richmond, Lower  
part fossiliferous, How  
much of this is Saluda?

54 ft Middle Richmond. 57 ft.

Richmond section.

47 ft. Lower Richmond.

152 ft = Total Richmond.

5 ft. Same to top of Richmond.

6 ft. down to top of Richmond in  
Warren bed.

36 ft. down to top of Richmond  
west of road to S. W. 1/4.

412. Gatchell + Sons,  
1 square west of Junction Station.

Saluda section.

Saluda  
layer, Saluda

Saluda bed of Richmond.

Saluda layer

Saluda layer, Saluda

Saluda layer, Saluda

Saluda layer, Saluda

Saluda layer.

Saluda layer of Warren bed.

Saluda layer, Saluda



Encl. 1



Concord Ky.

Clinton base.

48 ft Upper Richmond, Lower part fossiliferous, How much of this is Sabuda?

57 ft Middle Richmond. 37 ft.

Rebuckella in middle.

47 ft. Lower Richmond.

152 ft = Total Richmond.

5 ft. Above the Strophomena bed.

6 ft. down to Strophomena in Clinton bed.

36 ft. down to clay in the same level at same station.

412. Gatchell & Sons,  
1 square west of Junction Station

Clinton. Ky.

124° - Richmond  
32° Massive Sabuda  
23° More clayey Sabuda  
10 1/2° Fossiliferous white of Rich.  
in bed.  
1° 6" Strophomena layer  
5° Coniferiform. large Liopora.  
Fossils in lower Richmond  
36° 6" Liopora or Lower Richmond  
in bed.  
1° 6" Clinton bed.  
8° Nodular base of Warren red  
at base.  
28° S. in this section as a layer.



Harrod's creek. From Traction  
bridge 200 yds north to first  
hill, south of road bridge.

Traction bridge.

20 ft Not exposed well.

Limestone, sand base, only exposed  
(near top).

Upper exposed clay with limestone interbedded  
Calymene elegans, Orthoceras, etc.

3' 6"

3' 6" Diaphragma, Atrypa, etc. species.

Upper exposed clay with Dictyonella, Encrinurus,  
Trematospira, etc.

6 ft Exposed limestone. Lower foot is  
more clay limestone. Contained  
Heterotrypa at lower third division.

9 ft clay clay rock, Madison like, &  
speckling.

3 ft chiefly purple clay

8 ft 6 in. Clay rock.

Clinton with Orthoceras, etc.

## Florida Heights

60 ft from base of quarry to first out-  
crop of Devonian limestone, but  
top 5 ft of this section is not  
exposed. 55 ft up = Clinton  
many plicatums, abundant,  
Heterotrypa, etc.

Rocks more massive than in case  
of Laurel. While clay at top is residual  
clay, due to decay of limestone.

16 ft from base of quarry to RR level.  
Upper 8 ft of this belongs to Louisville, lower  
RR level = 439 8 ft - Waldron  
according to from an.

Photo. 5.

Same quarry.

515 - Devonian corals

8 1/2 ft Not well exposed

15 ft upper quarry rock, better  
bedded & makes better build-  
ing rock.

36 1/2 ft lower or main quarry,  
used for crushed rock for  
road material

8 ft too soft for road ma-  
terial.

Blue soapstone & clay rock  
= Waldron.



Anchorage July 9, '06,

19 ft below Tracy's Well corner is Devonian Silurian contact. Plenty of corals within 5 feet above = 672 ft above sea.

2) P. Van Allen, East side of H. T. creek, near Headquarters, south of Tracy's Well. Lower Limerick limestone with Pentamerus layers & large Halysites, = means? up to level of base = 720 at least. Devonian not seen at all.

3) Dr. Herbert Corwell, quarry, 1/2 mile East of County line and 1 mile west of Peace Valley, 1 mile north of P. R.

Lower Limerick l. Waterlain clay. Upper Limerick l. is greenish blue, well bedded layers.

4) Further east, Base of Waterlain clay = 740 ft.

5) Contact at 670 on Brownston hill, east of Peace Valley, Fork of H. T. creek.

6) West of Peace valley, branch of H. T. creek.

Top of upper Argood clay = 674. This indicates Clinton at 644 about.

7) On road from Wilmington N. to Black Bridge Base of Clinton = 562. This is 130 ft below corner 691 in County line and the Silurian section =

60	85	85	60	Yarn	12
562	43	43	43	Gravel	43
49	32	32	32	Gravel	30
30	55	55	55	Cap. l.	647
	19	19	19	Cap. l.	
	2	2	2	Clinton	
				145 ft about	

Silurian top should be not over 697 or 700 but as neither of fact Devonian was found at Tracy's Well. Possibly Limerick is not 60 ft thick here.

Water level of creek at bridge is about 470. Bridge level is 485.

15 ft from water level to Clinton water levelian form. form near base of Limerick. In this case Limerick like capy. Limerick found about 10 ft below this level on 5 ft above creek. Plenty of middle Silurian rubble on the clay bank. Good section but not ideal.

Clinton at 485

Base of Clinton at 562

475 - Col. 77 ft interval.

47

562  
477  
47



east of Black Bridge,  
 1/2 mi. S. of  
 Linton 2-3 mi. S. of  
 Linton.  
 of Linton = 565 ft.

9 NE of J. of Road from Black  
 bridge to Poplar Grove School  
 house.

708  
 625

Devonian middle at 708  
 Limestone = 30 ft?  
 top of Walden at 678  
 Does the Limestone  
 thin out eastward?

10. Limestone up to 690 certain,  
 no evidence of Devonian up to  
 712.

11. Devonian middle at about a  
 mile and a half east of Poplar  
 Grove School house.

761  
 155

# Bromston July

12) Devonian chert at 762 at 3/4 mi  
 NW of turn in Poplar Grove  
 on Bromston jct.  
 Base of Walden is at about  
 712. Hence thickness of  
 the here is about 38 ft.  
 again suggests thinning of  
 Limestone toward  
 east.

13) On south side of valley, Walden  
 clay = 13 ft, well exposed. Devonian  
 chert is about 12 ft farther  
 than 30 ft above Walden is  
 12 as far as exposure on  
 road.

14. Chert is exposed at 626.  
 2 ft 9 in. upper part clay.  
 16 1/2 ft lower part clay, 5 1/2 ft clay, limestone.  
 4 ft basal Niagara.  
 12 in. of chert below Chert.  
 14 in. lower 1/2 in.  
 28 ft medium massive 590  
 20 ft thin bedded Madison, fossiliferous,  
 chiefly Helvetella, Syngnathus, but also  
 Strophomena, Strophomena, Strophomena.  
 Pugnatorius copious very large & got  
 down 8 ft above base and  
 down at same level but  
 abundant about 2 ft



12 ft *Strophomena* & *Dianthis*  
 subquadrate, not well exposed  
 or as to determine *Strophomena*  
 but approximately correct.

8 1/2 ft *Strophomena* base, large *Strophomena*  
 rather common & in *Leptaena*.

9 ft at base, *Strophomena* retentive *Stropho-*  
*asma*.

8 ft more clay & fossils fewer.

17 ft Sandstone clay rock, possibly  
 by the *Pseudomadia*, the  
 base of this rock is at crossing of  
 creek = 102 1/2 ft below Clinton  
 base. *Leptaena* *Strophomena*  
 from above top of this *Pseudomadia*  
 Madison. The large *Leptaena*  
 occurs 5 ft above base, *Pseudomadia*  
 occurs at base.

8 1/2 ft  
 1 1/2 ft  
 10 1/2 ft

Found a specimen of *Calymene*  
 in lower part of lowest fossilifer-  
 ous section, about 18 or 19 ft above  
 creek above the *Leptaena* *Stropho-*  
*ma* zone. Believed to be in  
 situ.

15) Going up hill again. Devonian  
 an *Oriskany* is found at 70 1/2 ft.  
*Leptaena* is medium: 17 1/2 ft  
 about. And *Waldron* clay is  
 immediately beneath.

30

16) 2 miles S E of S by light.

740 Devonian *Oriskany* = within 5 ft of

719 1/2 = base of *Waldron*. <sup>top of *Waldron*</sup>

43 ft = *Leptaena* - exact measurement

3 ft = Upper *Oriskany* clay 70

5 ft 4 in = *Leptaena* *Strophomena*

16 1/2 ft = Lower *Oriskany* clay 719

12 in = *Oriskany* *Strophomena* 72

22 in = *Oriskany* *Strophomena* 64 1/2

18 in = *Oriskany* *Strophomena* 647

8

72

791

80

621

17) Head of *Oriskany* Creek.

Base of *Waldron* = 719.

(5 ft of *Waldron* *Strophomena* = 732

*Strophomena* cert. am up to 740.

No *Leptaena* *Strophomena* seen.

Base of *Strophomena* about 646 about.

Many here in upper part of *Oriskany*.

Well bedded. plenty of *Oriskany*. *Strophomena*

which is

18) Near end of up.

762 *Waldron* *Strophomena* 7 of *Oriskany* *Strophomena*

distinctly bedded.

*Strophomena* fossils in *Oriskany* 1 in.

*Strophomena* only 4/8 to 5/8 in.

*Strophomena* fossils common.

But *Oriskany* up to 765 at least

13

13

71

97



19) On road from Skylight to Wells Landing

654 Base of Waldron.  
According to this the base of Permian should be at 580  
and Devonian should be at about 680

20) 685 Top of Waldron  
Base of Waldron = 672 ft about,  
14 ft of Louisville exposed,  
Base of Devonian about 700

21) 1/4 mi west of Skylight.  
Devonian chert abundant

22) 1 mile NW of Smith Church 729  
Devonian chert at 694  
Louisville limestone at 13 ft

23) 1 1/2 miles SW of Smith Church.  
On hill

715 Devonian chert with *Hedrophylum*

24) 1 1/2 miles NW of great oak in pine  
and on South side of Taylor's creek.  
675 Devonian chert, *Calymene*  
680 - base of *Hedrophylum*

25) South of Taylor's creek, along road

656 Devonian chert.  
Underlying Louisville limestone  
at least 16 ft and probably 20  
ft thick.

Louisville chert with *Pentamerus*  
*Alcyon* and *Stromatolites*, 1 inch  
calyxes, finely striated. This species  
appears common in lower 15 ft of  
Louisville limestone.

11  
13  
17

26, South side of Sinky Fork, along road

665 15 ft Devonian limestone, local  
5 1/2 ft *Hedrites* in Louisville limestone,  
11 ft massive Louisville with *Pentamerus*  
22 ft ordinary Louisville limestone.  
27) Road Graham to Wolford Landing.

666 Dev chert 12 ft further up.  
63 ft Louisville limestone. *Alcyon*  
607 Top of Waldron.  
Glacial boulders of white limestone

28) On Wolford road.  
654 Devonian chert.

29) Near north end of Wolford road

566 Top of Waldron clay.  
597 2 1/2 ft of Louisville *Alcyon*  
630 - base of *Hedrophylum*

566  
13  
597  
11  
630



30) ~~From my Landing road, NW of Graham,~~  
~~Glacial pebbles debris, granitic grains,~~

31) Immediately above - Der. chert with green.  
645 1/2 Devonian limestone with corals,  
642 Highest Louisville exposure with  
Stromatolites 1 inch Calyces.  
608 Limestone layer very persistent  
The Waldron was not iden-  
tified here, but may be 25 feet  
lower down if the Louisville  
limestone in this neighborhood  
is 63 ft thick.

32) SW of Graham 1/3 mile,  
678 Devonian limestone with green  
7 Stromatolites, in situ. The  
crinoid layer may be beneath.

33) 1 1/3 miles SW of Graham.  
643 Devonian chert, corals, abundant.

34) Going up hill south of Pond creek,  
642 Devonian corals chert.  
622 Louisville with Stromatolites  
Also Devonian in situ at 642 and  
Plenty of Devonian chert down to  
6301 but may be undisturbed.

35) Just before reaching road corner 647  
2 1/2 miles S with west of Graham.

635 Plenty of limestone with Der. corals  
640 limestone with Der. brachiopods.

### ~~Prospect~~

36) 1 1/4 miles NE of Prospect  
598 Devonian limestone with plenty of  
Devonian corals.

37) 1 1/2 miles NE of Prospect  
628 Der. limestone & corals

38) 1/3 mile SW of Road corner 647  
614 Silurian limestone with Stromatolites

39)  
637 Der. chert with corals. 578  
44 ft Louisville li. 71  
15 ft Waldron = 598 at base. 508

40)  
620 Der. limestone with plenty of corals  
resting on Louisville limestone  
578 Top of Waldron.  
Thickness of Louisville = 42 ft

563

71

492



41 One mile SE of Harmony  
 Limestone  
 Dev. l. *Spirifer* and shells abundant.  
 16 ft. but small.  
 Dev. l. with fossils.  
 5 ft. interval  
 { Dev. limestone corals abundant.  
 5 1/2' interval  
 { Dark corals abundant - mostly  
 ferns seen here.  
 Top of Limestone at about 620  
 Limestone at least 57 ft thick.

42) S.W. east of corner 647.  
 Devonian with corals large  
 593 Top of Limestone

43.) NW of bridge 494 on River Road near Harrods Cr.  
 Top of Waldron at 555

44) Near road corner just west of Harrods Cr. River Road  
 483 base of Clinton, salmon brown 3 ft thick  
 just below road corner.

45) East of bridge Harrods Cr. River Road  
 586 Base of Waldron clay.

46) 1/4 mi W of Harrods Creek. River Road.  
 552 Top of Waldron clay.  
 549 = about base of Waldron.

47) Half a mile west of Harrods Cr. River Road  
 590 Base of Dev. limestone with fossils  
 of large corals.  
 about 43 ft = Limestone,

48) Waldron 14 ft thick,  
 518 Base of Waldron.  
 532 Top of Waldron.

518  
 71  
 447

620  
 67  
 553  
 15  
 568  
 22  
 472



Jeffersonville, Tenn.

49) 2 miles SE of Jeffersonville, Tenn.

686 Clinton bed. Very crinoidal

50)

683 Clinton base.  
Lower Oxford clay. Oxford limst.

51) Between Bugn & Shunk's Branch

689 Clinton base

618 Columnaria abeylata? abundant

612 Calapocia

611 Columnaria calycina

52)

Traces of Hitz layer but not of the Clinton  
N. Clinton seen for last mile.

53)

664 Top of main Osgood bed, abeylata?  
4 ft lower Calapocia & Columnaria  
1/2 ft lower of Streptelasma medium  
Calycina layer is lower still

54)

575 Rhychoenceus dentatum  
Leptæna rhynchonellid  
Platystrophia lyonsi

104  
575/59

55)

527 Leptæna rhynchonellid  
Platystrophia lyonsi  
Dinorthis strobilata excellent spec.

56)

588 Immense masses of calycina  
some 2 ft wide and 1 ft thick

596 1/2 Upper Columnaria abeylata?  
layer. Corals large 1 ft and  
abundant

598 1/2 Fossiliferous layer abundant.  
Streptelasma rhynchonellid & Streptelasma

619 Fossils abundant up to the level  
Farther up they are more scattered

57)

2 ft 4 in section from Clinton

3 ft basal Niagara

Lower Oxford clay 2 ft farther  
18 1/2 ft 18 in no fossils  
15 ft clay

5 ft Oxford limst. no  
2 ft 9 in upper Oxford clay

677 Top of upper Oxford clay  
The fossils from base of  
dip all along the road.  
which had been nearly at  
dead level. Good place for  
lower Oxford clay. Good fossils as in  
Jeffersonville taken from Oxford.



58) About 2 1/2 miles S of Jefferson  
West of Chenoweth chert.

Osgood limestone

Lower Osgood clay,

2 1/2 ft basal Niagara

648 -> Clinton of regular type,  
Hitz basal bed present,

59) About

2 ft 6 in basal Niagara,

6 in Clinton Zaphrentis linguiformis,

Hitz bed,

17 1/2 ft lower Osgood,

5 ft Osgood limestone,

2 ft 9 in. Upper Osgood clay,

680 - 3 1/2 ft interval,

= 648 ft for Clinton base,

60) School house, 1 1/2 miles West of  
Suttonville.

651 = base of Osgood limestone

17 1/2 ft = thickness of Osgood clay lower

633 1/2 = top of basal Niagara

Osgood limestone quarried  
here.

630 = base of Clinton.

-642

61) Upper Osgood clay,

Osgood limestone

Lower Osgood clay

3 ft basal Niagara

2 1/2 ft Salmon brown Clinton - about 612

62)

632 = top of Osgood limestone

604 1/2 = Clinton base therefore

63)

2 ft up to Clinton base.

23 ft up = sandy stuff decayed up to 642

39 ft up = solid limestone = up to 619?

23 ft up = up to 580?

5 ft up small Columnaria halli.

Large Calymene 2 ft across,

3 1/2 ft up to top of basal Niagara

19 ft interval up to gate = 660 correct

as far as

few second

goes,

660 = gate 641 = top of Osgood limestone

3 1/2 ft Osgood l. base at 637 1/2

18 ft Osgood clay lower.

5 ft (5 ft Clinton basal Niag. not exposed)

62 ft interval.

Columnaria layer, halli.

5 ft interval

large Calymene 2 ft across.

Only Calymene certain.

Carthago filiformis, large up to 1 1/2 ft.



64)

599 Clinton base,  
66 ft up to base of Clinton.  
7½ ft up to Schuchman layer,  
Columnaria calycina,

65)

633 top of layer, limestone  
5 ft. Esquimaux limestone  
Esquimaux clay lower,  
Clinton, all well shown,

AA)

Madison  
Michigan roads

Clinton base  
21 in. Esquimaux limestone  
50 ft to base of heavy limestone  
110 ft to top of great coral reef,  
9 in. heavy limestone, lowest part  
13½ ft up to base of heavy limestone  
Esquimaux limestone  
7½ ft up to layer with Esquimaux  
26½ to top of clay rock top of Madison  
Dinorthis near base layer good,

## Jeffersonian

66)

18 Clinton base

East along RR is Rafinesquina all small  
below medium size, Columnaria  
Billingsi form, medium size, and  
Heterolites crassa striata, in City bed.

Photo. 1. Quarry east of Tuckers, Lower  
Laural, above the lowest however.  
See former notes.

Photos, 2, 3. Osmond formation at  
overhead bridge about 1½ miles  
east of Jeffersonian.

Photo. 4. Same as last, but showing  
slide of upper clay toward  
the west with very oblique almost  
vertical fault planes.

Photo 5. Florida Heights Louisville  
limestone, 4 PM.

Photo 6. Walden Clay cut grassy  
east of Chicago



<del>III</del>	Dal.	<del>I</del>	Dalme.	<del>I</del>	Gabelsch.
—	Lössp.	<del>II</del>	gast.	<del>I</del>	Esterm.
<del>III</del>	nrd.	<del>III</del>	nrd.	<del>II</del>	nrd.
—	Concord	—	Concord	—	Concord
—	Dim.	—	Dim.	—	Dim.

Photo 1.2. I covered limestone in  
gravelly  $1\frac{1}{2}$  east of Amherst.  
In this gravelly the top 17 ft.  
= building rock. Then comes  
rougher and good chiefly for  
covered rock. = about 13 ft.  
At base is better bedded stone  
= good building rock.



63)  
55)

12  
43  
20  
80

Paralithra

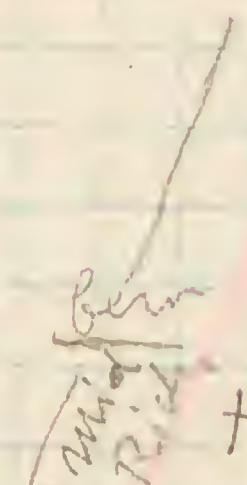
Calycina bed.

55)  
56)  
57)

52)  
53)  
54)

64)  
cl.

63)  
cl.



Calyc. bed.

Tetrad. calyc.

hall. calyc.

Cal. calyc.

Cal.  
Warran

Din.

+

Din.

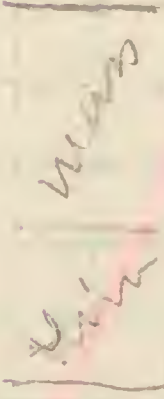
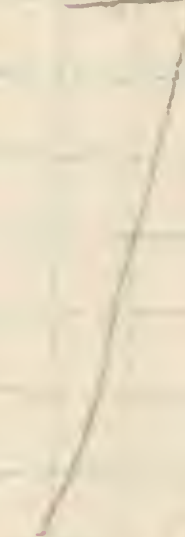
Din.

50)  
cl.

14)  
Warran

7)  
E. J. J.

E. J. J.



hall. calyc.

stroph. calyc.  
stroph.  
Calyc. bed.

calyc. bed.

hall. calyc.

Warran



Beard's

67)

2 ft Basal Niagara  
20 in Clinton salmon brown.

673

base of Clinton.  
About 15 ft above level of  
main, which is huge Column-  
aria layer, with sandy  
clay full of fossils beneath.  
These fossils include Strept-  
elasma medium com-  
mon and one Portia.

Large Trilobites occur along  
a stratum the Columnaria  
layer.

68) S E of Brownstown, 3/4 mile.

686 Base of Clinton from Clinton

69)

Silurian to very top of bed but a  
few miles from Brownstown fossils  
which must have dropped a  
considerable distance. Otherwise  
there would have been much more  
chert here, while in the Silurian  
section in Brownstown up to the  
top.

750 Base of Madison Top of bed 78

70

NE of Brownstown.

5 1/2 ft Limestone chert above this level,  
13 ft Limestone with Portia  
which would not have dropped  
16 1/2 ft to base of exposure of Limestone  
9 1/2 ft from road to base of Limestone.

71)

646 Base of Clinton

72) SW of Brownstown, W side of road,  
635 Base of Clinton  
Clinton = 2 ft 4 in  
Basal Niagara = 3 ft.

73

654 Top of Bedford Limestone

74)

720 Devonian chert, on also  
gigantic.



Striped from July 19, 1901.  
Shepherdsville, Ky.

- 1) Walden Clay  
Cox Quarry.  $1\frac{1}{2}$  mi. East of Anchorage
- 2) Upper Laurel 0-17 ft below Walden  
Cox Quarry  $1\frac{1}{2}$  miles East of Anchorage
- 3) Clinton #67 locality,  
 $1\frac{1}{2}$  miles NW of Beards
- 4) Louisville limestone Building  
ledges 8-23 ft below Devonian  
Flower Heights quarry.
- 5) Louisville limestone. Road  
cut, 23-60 ft below  
Devonian. Flower Heights,

Jeffersonville. July 21,

- 6) Oxford, upper 13 ft,  $1\frac{1}{2}$  mile E of  
Jeffersonville, at overhead bridge
- 7) Oxford, lower 5 ft. North of  
Seatonsville.
- 8) Oxford, upper 13 ft. North of Seatonsville
- 9) Lower Laurel, quarry  $\frac{1}{4}$  mi. East  
of Tinsley
- 10) Upper Oxford clay, above Oxford  
limestone.
- 11) Oxford limestone La Grange

Shepherdsville, Ky.

- 75) West of Floyd's fork.  
473 ft top of limestone as proposed. Haly  
sites, Mottfieldella very small. Pentalon  
No Stromatolites. Exposed extends  
down to 444 = 29 ft.
- 76) East of Floyd's Fork. As far as  
house of J. De Hough. Same rock.
- 77) At crest crossed by road. Nodular stuff  
collected. Phosphatic?
- 78) Back of house in mm. R. G. B.  
Louisville l. with Conchodonta  
numerous plications. In common  
form. At 500 ft level. No Devonian  
seen.
- 79) West of G. W. Peacock.  
Louisville limestone with Conchodonta  
narrow and numerous plications.  
Collected.
- 80) "Bonnie's" home.  
Silurian up to this level. Slopes  
strongly west.
- 81) Limestone assumed to be Silurian
- 82) Pleasant Grove school house.  
Limestone assumed to be Silurian.  
Base mark = 577 ft but Silurian  
runs above this.
- 83) Silurian up to 600 ft level.
- 84



Pleasant Grove Church, Silurian at 580 Tyellia,  
 South of Pleasant Grove Church,  
 Waldron 19' 2" to  
 Top of Waldron = 532 ft,  
 Limestone = 48 ft at least accord-  
 ing to this,

86) Ridge way Ford (Whitestown)

16 1/2 ft Waldron clay,  
 47 1/2 ft Limestone  
 21 in clay shale. Upper beyond clay  
 7 1/2 ft limestone getting clayey  
 toward base, beyond limestone,

87) Silurian limestone. J. A. Prigg  
road corner.

88) Strombodes fairly well preserved,  
Tyellia in chert boss.

89 Silurian up to 640 at least.

90 William Elliges, Silurian,

91) From 617 to 631 = 14 ft clayey  
possibly Waldron but too  
poorly exposed for certainty.

92) Good exposure of Waldron here  
from 614 up.

93) 631 = base of Waldron

94) Oscar Owen  
640 = base of Waldron

95) 648, base of Waldron

96) 662 base of Waldron

97) 26 in. Upper beyond clay,  
619 = top of beyond limestone,  
6 ft beyond limestone,  
about 20 ft beyond clay well exposed.

98) Upper beyond clay well exposed  
beyond limestone top = 640  
Lower beyond clay

99) Fine exposure

632	617
630	615
628	613
626	611
624	609
622	607
620	605
618	603
616	601
614	599
612	597
610	595
608	593
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602	587
600	585
598	583
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42	27
40	25
38	23
36	21
34	19
32	17
30	15
28	13
26	11
24	9
22	7
20	5
18	3
16	1
14	-1
12	-3
10	-5
8	-7
6	-9
4	-11
2	-13
0	-15



West Washington

100) 670 base of Ogish limestone.

101) 707 = top of Ogish limestone

102) 719 = top of Ogish limestone

103) In front of house

The Ogish limestone and  
Lower Ogish clay are well exposed,  
11 ft below road level, top of section = 702  
691 = top of Ogish limestone

104. Ogish limestone. solid 1 ft.  
Ogish limestone weathered badly 1 ft.  
Ogish limestone 4 ft massive.  
Ogish clay shale 22 ft. Cedar glade  
662 = Clinton top,  
2 ft basal Niagara  
3 ft Clinton a thin bedded

105) 684 Clinton top, a thin bedded,

106) 690 = top of Clinton brown clay shale

107

Base of fossiliferous section. Heteropora  
615 = top of pseudo-Madisonian = 27 ft  
588 = base of pseudo-Madisonian  
Modular clay rubble = 22 ft with layers  
like pseudo-Madisonian rather sparse  
by scattered in it.

Clayey limestone 2 1/2 ft.  
Clay shale 3 ft.

561 Top of fossiliferous section.  
Interval of 3 ft. = Base of Richmond of Middle  
Large Platy. Lynx. Large quadrilateral form,  
abundantly fossiliferous 2 ft also containing  
base of Rich.

Coarse cross bedded limestone 2 ft 6 in  
thin bedded of this layer. Com-  
tain no large Platy. Lynx  
3 ft very irregularly bedded limestone  
fossils very few except on surface  
of one layer near the top. = basal  
bed of Richmond section.

Richly fossiliferous, 7 ft  
Septarian top of horizon at which  
Septaria is common, Platy stone  
plus very much elongated clay  
limestone as in clay actinolite  
from which I can not distinguish  
it.

14 ft interval poorly exposed, proba-  
bly all one, fossiliferous, clay  
limestone stuff full of Septaria  
etc., judging from section east  
of Pipe branch of T. & E. road  
west of Fishville on R.R.  
Does the Rhy. dentation occur in upper  
part of this section?



102) Continued.  
543 D. in other ret. ossa longior, asso-  
ciated with *Leptacma albimbricoides*,  
*Leptacma* or *Leptacma* not  
leaves.

543 D. in other rocks as a horizon, associated with Leptæna subumbrella, Leptæna volans me ft lower at least.

~~These C. ...~~  
belong to ...

10P)  
D20 = NP of layered limestone

109)  $\Sigma$  of largest elements are = 729

110)  
705 = top of rock layer limestone  
that preceding records are  
not showing the stone or red  
to top of lowest layers of stone  
and some limestone layers  
some have a rather porous above  
the upper layers and  
usually are 2 to 4 feet thick  
as good limestone 5' is H.

Base Material 2/7

Salmon in Chutney 3 1/2

*Cedra glabra* *mont. R. L.*

38 in = Clinton, Cedar glades 20 Jan.

~~No Clin~~ ~~tor~~ ~~er~~ ~~joined~~ here but deep red clay probably caused by disintegration of this rock.

113) 642 *Columnaria halli*.

Sea level at highest point above ground  
of Madison, = 706. = 1000 top of  
massive Madison.

Medicine massive.

Northward, at 242 ft top of upper  
Chumminian. Below layer. Lower  
layer recess about 5 ft down  
from - also Col. beds. It is  
also seen here.

Top of ~~placid~~ ~~shagreen~~ at 642.

Crack bed = near base of pseudo-  
macdison with characteristic  
*Columbianella acrostata*.

17) Large Plat. Lynx and numerous  
in groups. Good collecting ground,  
but no Lepidoptera. Mostly, large birds  
mound and concealed at some distance.



118)

612 = top of Pseudo Madison  
 628½ = top of (upper?) Columnaria  
 bedded layer, large massive  
 crabs. Believed to be upper  
 layer.

119)

Upper part of Massive Madison.

120)

Columnaria alveolata in lower Pseudo  
 Madison.  
 14 ft. interval.  
 Fossils, hystrans etc.  
 5½ interval.  
 653-5 ft. yellow bedded layers.  
 fossils & clay.  
 643½ cross bedded layers,  
 clay.  
 Strongly cross bedded layers in creek  
 bottom. Main creek at 632½ as  
 three photographs at Mount  
 Washington.  
 Large Platylux common 2 ft down.  
 8 ft interval.  
 Rough limestone but not dis-  
 tinctly cross bedded.

121)

North of Floyd's Fork  
 628 = top of Lower Esquimaux clay

122)

North of Mt Washington  
 617 = base of Clinton

— Mt Washington —

123)

base.  
 609 Salina brown Clinton 2½ ft.

124)

634½ Salina brown Clinton base

125)

655½ Salina brown Clinton base

126

NW of Ding  
 670 = top of Esquimaux limestone,  
 about 640 = Clinton base.

127)

Just east of house  
 640 = Clinton base

128.

William Eldridge  
 5½ Esquimaux limestone. 2 ft 9 in. Upper Esq. clay,  
 19½ ft lower Esquimaux clay,  
 2 ft 4 in basal Niagara  
 30 ft 8 in. Salina Clinton.  
 Clinton base = 628,5

665?

659

659

30.5

628.5



129) SW corner of Mt Washington  
639 base of Clinton  
basal Niagara = 2 ft.  
Clinton = 3 ft.

130) Mt Auburn Pl. *lynx pumilus*

131) Gravel rocks very strongly crossbedded,  
full of large Pl. *lynx pumilus* -  
diatom film

132) at mouth of stream  
Top of coarse crossbedded layers.

133) 485 = *Rhynchotrema dentatum* zone  
but apparently not far from place.

639  
522  
2117  
58  
522  
580

617  
522  
95  
47  
522  
5

639  
522  
117

646

Plaxton

135) 3 ft upper Esopus clay  
629 = top of upper Esopus clay.

136) Esopus limestone.  
Lower Esopus clay = 21 <sup>1</sup>/<sub>2</sub> ft.  
basal Niagara 3 ft  
Clinton 3 ft.  
base of Clinton = 597 ft.

137) Top of Waldron clay

138) Top of Waldron clay, = 643

139) 627 = Top of Waldron clay.

140) Upper Esopus clay 2 ft 9 in.  
Base of upper Esopus clay = 4 ft above  
Cedar creek.

141) 583 = base of Waldron clay.

142) Niagara chert. *Gyellia* *str. umbrosus*

143) base of Clinton = 522 ft.  
22 ft lower Esopus clay 608 mark  
4 1/2 ft basal Niagara 28 ft.  
3 ft Transition. 16 ft Laurel house  
3 ft 6 in Clinton. 3 ft 4 in upper Esopus clay  
24 ft Waldron. 5 1/2 ft Esopus limestone



144

Silurian chert with Stromatolites,

145)

30 1/2 ft Laurel, apparently, lenticled at top.

146)

59 ft Limerick — 544  
10 1/2 ft Limerick — 505  
16 ft Walden Clay — 479 1/2  
24 ft Laurel  
Calculated at 394 ft.

147)

Silurian chert with Stromatolites at 569.

148)

1/4 mi W of Thaxton,  
682 = base of Walden.

121)

Hazy Springs,  
upper Oxford Clay 3 ft  
Oxford limestone 6 1/2 ft

149)

at bridge N of Bannockburn  
Base of Dickinson 475 Nielsen

150)

Base of Walden about 660

151)

Cedar Creek, just above Clark occurs the Walden clay apparently, partly exposed.

152)

Road corner

Silurian chert with Lenticles

153)

Church

685 = chert with Stromatolites  
Calculate the base of Limerick between here and 151.

154)

680. Between here and 687 and 670 the land is flat like residual land east of Shepherdsville.

155)

675 = Midway deep red residual material like that found from clay 4 1/2 mi. or more west but in Silurian zone.

156)

666 = Limerick with Halysites. No good evidence of anything from being Limerick residual material

157)

651 top of Limerick exposure chert & limestone



158)

158) Striped bedded sand fragments  
Solid to meet one immediately  
below

159)

632 = top of Silurian chert with Str. m.  
traces. One not called dark De-  
vonian residual nodules stuff  
immediately above

160)

Silurian chert up to 640.

161)

Decayed material which may have been  
Devonian at about 640.

162)

Flat plain like country from here eastward  
+ south east.

163)

Up to 660 Str. nodules with Silurian  
chert.

164)

Nodular debris like that called  
possibly of Devonian origin.

165)

Rock in bed of Fern creek. Sp. nodules in  
day is here, it must be immediately  
above since quarry exists at bridge  
level.

166)

Lyellia in rock in situ.

167)

2 miles S of Newburg.  
Silurian - up to 500, Crinoid stems  
and Halysites, Lyellia.

168)

Silurian

169)

Silurian at about 540

170)

Silurian at 545 Str. nodules.

171)

Rather large quarry, Lower Devonian

172)

Silurian lowest one up to 540

173)

Rather large quarry, 550

174)

Lyellia at 530

175)

Lyellia at 550.

176)

Silurian



177)

Silverton up to 495 and Grinnellville creek bottom. Calcareous thinness here

178)

Grinnellville down to creek bottom

133)

West Washington

5 1/4 widely fractured and clayey, large bryoz. 1 1/2 ft from top. *Leptaena* at base.

*Blatopora cyathiformis* common

14 ft from above down to level with Rhynch. dent. stream in site. This is at entrance of wagon road south of shed into the creek, for crossing to west side.

10 ft down to top of strongly cross-bedded layers with *Leptaena* down as far as left column goes - down into base.

179)

*Retrovia* a dirty grey above the Rhynch. dent. stream horizon here

180)

100 yds N of Mr Christ Richardson

*Leptaena* + *Retrovia* from above 5 ft massive coarse limestone

Rhynch. dent. stream is down in bed of creek. L. layer. Not all of it with *Leptaena*. What is in place

182)

First horizon beyond road corner

665 = top of coarse *Columnaria halli* layer, very large & 2 1/2 times the layer below in the pseudo *Blatopora*

(600 = above base of pseudo-*Blatopora*)

181)

Top of massive *Columnaria halli* = 665 ft. *Stroph. reticulata* occurs at this immediately.

183)

568 = top of 5 ft massive limestone with *Leptaena* above, at point west of 650 ft level on ridge.

135)

*Retrovia* is found just below *Leptaena* 5 ft layer, lower whether in situ or not is not known but should not be very recent. It is found just beneath coarse layer with Rhynch. dent. stream 5 ft lower down.

*Retrovia* there for apparently 5 ft above below coarse 5 ft lowest layer.

184)

588 = top of massive *Columnaria*  
652 = *Chert*. interval = 64 ft.

185)

2 ft upper clayey shale  
7 ft coarse limestone



186) N of Grinnell Ford.

2 ft salmon Clinton

14 ft rest of mass. Madison 600

19 1/2 massive Madison

up to base of massive Madison

25 1/2 ft { Striped, which is immediately above,

{ *Strophomena halli*.

17 ft { more fossiliferous in top of massive corals,

16 ft sandstone - in which are corals.

33 1/2 Heavy Madison, Heavy 18 in. ledge at top,  
fossils at base.

8 ft (thin bedded clay shale almost pure fossil.

11 ft, less fossiliferous above

Flat lying above + other fossils, below

3 1/2 ft massive coarse limestone.

476 = base of coarse limestone.

changed badly to a clay rock in the

6 ft Coarse limestone lower part de-

12 ft brown argill. clay.

11 ft lower argill. clay with purple streaks

1 1/2 ft local Niagara

2 ft transition.

187

8 1/2 ft up to top of local Niagara.

544 = Clinton

2 ft upper argill. clay

5 ft Coarse limestone and

Coarse clay lower



Jeffersville area

188) Silurian quarry off the road.

189) Devonian at 620 crinoid l.

190) Silurian in pit up to 560

191) Strongly crinoidal whitish limestone, trilobites common, Upper Devonian. Black shale abundant very scarce, at 540.

192) Black slate exposed by telephone post hole.

193) Black shale crinoidal limestone contact at 528. Devonian limestone is ferruginous at very top.

194) Whitish limestone believed to be Devonian.

195) No exposure here.

196) No black slate struck in well, only a rock said to be a blue rock, and there are limestone which l.

197) Unionville up to 557. Quarry on Finley branch.

198) Contact of Coral Devonian in the Unionville is well exposed at 511

199) No exposure since 198.

200) No exposure but limestone is struck 8 ft down. This must be Devonian since black slate occurs 1/2 mile down stream.

201) up to 510 Silurian in good sized quarry. No Devonian exposed.

202) Silurian exposure near creek level.

204) No exposure

205) Devonian corals + graptolites at 470 in chert and in white limestone.



206.

Southern Brick and Tile Co.  
8 ft clay pit. Residual Devonian  
clay containing chert clumps with  
*Martina subumbra*. 6 1/2 million  
years.  
3 in to 12 inch tiles.  
618 Park Ave. Louisville Ky.

207)

Silurian with *Wedge* & *Lyellia*.  
Stratobolus up to 480 at least.

208)

Get up to 522. No fact tri-  
dence of any of it being Devonian  
but doubt known to me. It is known  
to be Devonian.  
Farmers say no black slate struck  
in wells, only limestone is struck  
above 540.

209)

*Lyellia* up to 520.

210)

Conclusive evidence with radiating  
stratification. *Stromatolites* com-  
mon up to 509 1/2 just south  
of Spencer Heart Cement.  
No limestone at top of ridges in  
wells.

211)

In this neighborhood no slate is struck  
in wells or on ridges.

212)

Barometer road N of B. M. chel.  
Top of Silurian with *Wedge* to 485  
overlaid by Devonian corals and  
*gastropods*.

213

Black slate on *crinoid* limestone  
at 618. West of power house, near  
house in south.

214)

665 1/2 to top of *Stromatolites* with 11 ft  
of *Wedge* above. East of *Stromatolites*  
not present owing to weathering.

215)

601. Top of *Stromatolites* at 649 - strong  
northward dip.

216)

*Lyellia* up to 500.

217)

Quarry in Louisville L.

218)

*Stromatolites* *Stromatolites* at  
about 710.



219)

Only Silurian material seen up to 720.

220)

Silurian up to 700

221)

Silurian up to 688 at least. Dev. rubble with *Strophodontia* with wide apart striae.

222)

Dev. at 682 considered Devonian but evidence is not clear, striae have disappeared.

223)

Silurian up to 680 at least. Gravelly. Limestone not be identified with confidence.

224)

Silurian up to 645. Stream enters cave here.

225)

Silurian to 650. Gravelly. Limestone not be identified.

226)

Silurian limestone up to 620. Fine spring. *Lyellia*.

227)

Devonian slate with corals.

228)

Stratigraphies in Louisville, Devonian corals at the corals immediately above. Corals at least in further up. No Black slate seen. Dev. in Louisville tp, at about 575 not measured.

229)

Middle town

Silurian up to 710 at least. No evidence of Devonian between this and Middle town.

230)

Nothing but Silurian seen up to 660 at least, probably up to 680 at least.

231)

No evidence of anything except Silurian east of here as far as 229. Silurian at least up to 690.

232)

Only Silurian seen here. No Devonian or far since Middle town.

233)

No evidence of Devonian from this point NE.



234) Devonian coral bed in creek bottom  
at 580.

235) Crinoidal top of Devonian limestone

236) First black shale exposure at 565  
Rest in Criniferous = Permian l.

237) Black shale brought up by telephone  
pole.

(238)  
Chert, ~~exposed~~ up to 575  
Silurian Devonian (corals) contact  
at 567.

239) 594 Silurian chert up to this level  
also on the next corner, a few  
large Devonian corals in the mixture  
probably dropped.

240) Chert age uncertain up to 615 at  
least.

241) Chert, probably Silurian up to  
652, may be Devonian above  
but chert is lower.

242) Chert at top of road corner proba-  
bly Silurian.

Madison, Ind.



7



Rest not exposed.

28 ft Cliff made of sandstone  
57 in thin bedded sand.

3 ft 1 in. Upper Oxford clay Photos 3+4.

4 ft 4 in. Oxford limestone.

13 ft Lower Oxford, Photos 5+6.

21 inches to contact.

21 inches Clinton.

53 ft Me. down down to top of Coral bed chert.

16 ft fossils, pieces but not very few.

25 1/2 ft down to Hebertella insculpta rare.

35 1/2 ft below Hebertella insculpta to 345 heads.



243) One mile east of Washington,  
St. m. lodes, Pentamerus at road  
corner, at least as high as 720

244) 686 = *Spirifer gregaria* in chert, also  
corals.

245) 679 = *Spirifer gregaria* chert.

246) 638 = Silurian with *Pentamerus* &  
coral bed of Devonian, + *gregaria*  
further up.

247) 642 = Silurian. Devonian corals  
last partially, Devonian chert  
with corals abundant,  
Silurian with *Pentamerus*

248) Silurian up to 610 at least, as far  
as I can make out from  
certain lines above.  
Base of Waldron at about 565  
judging from certain levels.

249) 541 = base of Waldron.

250) Devonian coral bed in situ at 598  
Silurian top = 5 ft lower well exposed.

251) Devonian corals abundant at 598 at  
turn of road.

252) 590 Silurian - Dev. coral contact  
well exposed.

253) 590 Devonian coral chert  
abundant.

254) A very large coral 6 inches in  
diameter in the volcanic  
order, at 585, near base of Devonian  
coral bed which is at 583 about  
533 - top of Waldron clay = 50 ft for  
Linnville bed - very accurate. 520  
515

255) 544 = Devonian corals in situ up to  
presently, what does this mean?

256) 573 = Devonian coral bed in contact  
with Silurian. 15 ft of Devonian  
exposed here. Collected from upper  
part of exposure = below cement  
bed I think.

257) Orthoquartz accumulation, large, coarse  
in Linnville rock near middle.



258)

555- Silurian, St. Lawrence, fossils collected,

259)

592. Silurian with Stromatolites, Devonian chert above

Fossils. 256,

*Strophodontia concava* J S

*populana* J S

*Spirifer formacula*

*Atrypa reticularis*

*Alcyon submenensis* J S

*Chonetes yondellanus*

*Pentamerella arata?*

*Meristella barrowi* J

*Ponagylus lobata* S

*Olenitoma submarginata* J S



37) old Shepherdsville

1 1/2 miles from Shepherdsville on  
road to Cedar Grove Church.

Black shale in crinoidal conifer-  
ous

Limestone with Pontanous thyrus

36) old

3 miles from Shepherdsville, along  
Creek below Lick Shale.

Bulls Run = Miller's Run, Mt. Mad-  
ison road,  
Madison clay  
Contact top of Limestone 3 ft

35) old

Miller's Run, 1 mi from  
Lick Shale.

Coniferous + very white = 4 ft, possibly  
Limestone 20 ft. Other contact?  
Madison clay.

34) old

Cedar creek, 1/2 mile beyond Lick  
Miller = base of Oxford clay, limestone bed  
bounded with red purple = 18 ft, 1/2 ft  
Oxford clay  
Contact on 6 ft in cludgy local Wagon  
partly shaly.

W of Fisherville section.

Saluda bed.

White water division of Rich-  
mond, above Columnar bed,  
1/4 mi. West of Pope Lick creek.

Upper part of pseudo-Madison  
section of Maynesville bed,  
1 1/4 mi. west of Fisherville,  
1/2 mile west of Pope Lick  
creek.



37) old Shepherdsville

1 1/2 miles from Shepherdsville on  
road to Cedar Grove Church

Black shale in circular Corn  
crops

Limestone with Pont ammonites

36) old

3 miles from Shepherdsville, along  
Cedar Creek Lick Shale

Bulls Run = Miller Run, not the  
highest water,  
Walden clay  
at the top of Gannet 3 in

35) old

Waller's house, 1 mi from  
Lick Shale

Coniferous = very white = 4 ft. 2  
Limestone 20 ft. 2 others are  
Walden clay

34) old

Cedar creek, 1/4 mile beyond  
Waller's house of Gannet clay, brown  
banded with red purple = 18 1/2 ft. of  
brown Gannet clay.  
Clinton 6 ft. in cluddy, local  
partly cherty

W of Shepherdsville section

1. Saluda bed,

2. White water division of Rich-  
mond, above Columnar bed,  
1/4 mi. west of Pope Lick creek,

3. Upper part of Pseudo-Madison  
section of Wynnesville bed,  
1 1/4 mi. west of Fawnville,  
1/2 mile west of Pope Lick  
creek.



450 Sheep lands mill.

- S - 60 turns

S 17 E 170 Road R to Lettman jet,

- - - E 210 Small stream.

At Stream is D. l. limestone on  
top contact with Black shale.  
D. l. limestone 6 1/2 ft exposed

concretized, especially upper  
3 ft. - Cement rock & contact not  
crossed.

- - - E - 50 turns,

N 80 E - 265 turns

N 30 E - 45 - creek, Buffalo Run.

Wayne limestone top  
465 above sea.

- - - E - 94 turns

N 30 E 125 Wayne limestone

N 30 E 129 at Henry C Hamilton  
508 above sea level. D. l. coarse

ly concretized limestone.  
Upper part of D. l.

N 30 E = 152 turns, Black shale to top.

N 80 E = 105 turns to contact.

512 ft above sea level. Contact  
coarse, concretized top of D. l.  
and B. l. shale.

Fine grained limestone, possibly  
ly - probably Wayne, 5 ft  
5 1/2 ft lower down.

- - - E - 66 turns

N 75 E - 69 turns

N 50 E - 180 turns to E Waymiller  
store on left.

Waymiller, at 565 at Village under  
store.

N 50 E - 46 turns

- - - E - 38 turns

N 65 E - 50 turns, turn left to  
Victory ridge road.

S 10 E - 15 turns Lick & Skillet  
store.

S 35 E 15 turns Cedar Grove road turns  
off here = 1/4 to Cedar  
Grove church.

Road here turns off to right  
up creek.

x S 75 E - 105

N 85 E - 65

N 50 E - 110

N - - - 37

N 75 E - 170 turns Barry Wadler  
at 525 above sea.

John Osborn

- - - E 45 turns creek small stream

- - - E 18

S 70 E 85 road on left

S 40 E Walden log 12 ft thick  
101 turns to head of road

N 65 E - 245 to Cedar Grove  
church on right.

Road straight ahead goes  
to Schinde. About 5 or 6 miles  
from Shepherdsville.

S 20 E - 66 turns

S - - - 130 turns

S 50 E - 78 turns

S 20 E - 140 turns

S 80 E - 146 turns



S 85 E — 160. turns Amanda Bonman  
— E — 88

S 85 E — 88 Probably Walden  
line at 670 above sea

S 70 E — 97

S 85 E — 86

N 80 E — 50 To Walden line at  
700 ft above sea level

N 80 E — 85

N 35 E — 110. Cor. l. crinoidal not exposed  
but along road side as  
road bulges.

Black slate hill by the line

N 75 E — 55 turns

S 80 E — 76 turns

— E — 30 To road line of left  
Burlington road. About  
2 1/2 miles to Kirby Jones place.

S 30 E — 63

S — — 60

S 15 E — 137 — At 675 (Dev. line)  
crinoidal, with black slate above,  
Dev. l. — 4 1/2 ft thick, all crinoidal,

S 20 W — 23 stream Dev. l. well  
exposed. Fossils at top &  
pyrite forms.

S — — 25

S 35 W — 40

S 10 W — 48

S 10 W — 58

S 5 W — 70 To top of Mayana  
exposure at 735 above sea.  
Dev. l. not exposed here. May  
be present. May. l. — 8 ft rests  
on Walden clay.

S 5 W — 20

S 45 E — 20

S 70 E — 45

S 35 E — 44 Walden line at 720

S 40 E — 48 Road toward left  
— creek road. Goes to Solitude  
road about 1 mi E of Kirby  
Jones, close to creek west of  
Solitude, — 5 mi to Solitude

S 40 E — 5

S 10 E — 105 to Come Springs Sta

S 10 E — 60

S 40 E — 31

S 40 E — 32 = top of the Mayana  
good exposure photograph  
June formerly

S 20 E — 100 creek both ways

S 60 W — 84

S 80 W — 23

R (S 35 W road to Deatville,

W — 145 turns, 720 above sea,  
top of Mayana exposure. May  
not be top of section Mayana  
but seems that way

W — 100

S 40 W — 105

N 80 W — 160

S 55 W — 40 turn Come Springs station

R S 35 W — 111

S 10 W — 230 to creek on county line

Clinton base = 570  
Walden well exposed near top  
of hill at county line westward.



S. NSE 45  
 N15W — 55  
 N25W — 70  
 N60W — 15  
 N5W — 90  
 N35E — 24  
 N15W — 30  
 N — 55  
 W15W — 50  
 N5W — 75  
 N15W — 52

N15W — 160  
 N15E — 25  
 N75E — 28  
 N15W — 90  
 N55W — 20  
 N45W — 90

Opposite Fancy  
 Dave Enares store  
 2 mi E of Cedar creek church  
 1/2 mi from Kirby Jones

N30E — 90  
 N5E — 20  
 N10E — 10 base of Clinton 690

N10E — 14 creek branch of Saluda  
 20 ft measure Saluda  
 N25E — 50 road to left

Stratum

S85E — 70 top of 2<sup>nd</sup> limestone  
 above clay above 1<sup>st</sup> clay l.

N30W — 35  
 N30E — 210  
 N10E — 20 Walden base 760 ft

N10E — 115 base of Clinton  
 N40E — 60 base of Clinton  
 stream flows across road  
 northward so that Cedar  
 stream begins at left side of  
 road

N10E — 20 road from left  
 N10E — 42  
 N45E — 30  
 N30E — 65 road off left  
 N80E — 166  
 N50E — 55  
 S75E — 50 Kirby Jones  
 Valley arms east in south  
 side of road from here

The creek east of Fancy runs  
 into Cedar creek about 1/2 north  
 and then Cedar creek runs south  
 and runs S all above about 5  
 miles farther on, about 6 or  
 7 miles below Greenville  
 ford.  
 - about 1/2 mi or 2 mi below  
 Ridge way Ford



N 65 W — 300  
 N 65 W — 122 Street  
 C & Crenshaw  
 N 65 W — 28  
 N 55 W — 75  
 N 65 W — 30  
 N 60 W — 45 Road on left,  
 N 85 W — 30  
 N 70 W — 60  
 N 85 W — 100  
 N 45 W — 50  
 N 70 W — 65 Road on R  
 S 80 W — 20 Creek  
 S 60 W — 45  
 W — 30  
 Cedar Creek Church,

300 Slate hill.

301 Black slate at 527 up this far at least.

302 at 480. May be Black slate here but if so, it is so badly weathered that the Black color shows only in a few thin layers. Rest is light colored.

303 at 490 Light colored soil may mean Wavely.

304 Good Black slate exposure at 480.

305 at 495 Black slate top with phosphatic nodules 10 inches long at maximum.

38½ ft light blue clay Limestone. Limestone clay believed to extend at least 27½ ft farther up. Total of at least 65 ft.

306 Black slate top

307 Plenty of Black slate thus far west.

308 Exposures from between 307 and 308. at 308 at a bend of 466 and for some distance below - 460 at least, Wavely clay shows up. Whether slumped down or not I do not know.

309 Sawmill at 500.

308 Black slate top at 464. judging by phosphatic nodules at base of Limestone clay exposure.

310 Limestone clay in stream bottom.



- 311 Where salt wells used to be, 420  
Limestone clay, fine exposures for long  
distances in every direction from  
here. No Black slate.
- 312 Fine Limestone clay exposures up to  
51 at least. Number wrong here.
- 313 At 457 There is black shale top with  
phosphatic nodules, well exposed.
- 314 No exposures since 313 and 310  
but here at 314 is wavy clay  
rock with ferruginous nodules  
in place. And much sandstone  
rock tumbled around base  
in creek bed. Above 539 level  
= about 545.
- 315 Here is heavy bed of soft clay  
shaly rock with iron nodules.
- 316 Wavy clay shale rock, with iron  
nodules, fine exposure on North  
side of stream.
- 317 Same wavy clay shaly rock (soft)  
with iron nodules. Iron nodules  
very abundant. 150 ft farther on.
- 318 Same rock as at 317.
- 319 Limestone at about 520

### Bricks

- 320 At 552 is top of Black slate with  
phosphatic nodules.
- 321 Nothing but Limestone clay since  
320.
- 322 White clayey shales. Almost  
like Limestone clay, but with  
ferruginous nodules. Shales  
like Limestone clay at least

- 323 Black slate but top not clearly exposed,  
fully 10 ft exposed in bank.
- 324 Silurian limestone, top about 1 ft  
above RR grade.
- 325 The same limestone with Str.  
mat. for roads may be followed  
up to here. No evidence of Dev.  
limestone.
- 326 Limestone exposures abundant.
- 327 Black slate thin up by very shallow  
roadside ditch.
- 328 Black slate down to creek level.

### Shepherdsville

- 329 Niagara limestone up to 482.  
Black slate at 493. But limestone  
just not exposed.
- 330 Crinoidal Devonian limestone, 1 ft ex-  
posed. Thickness very thin.  
= Crinoidal, at 493  
Niagara top = 1 ft lower down.
- 331 Niagara limestone up to 490.
- 332 Niagara limestone all way to next.
- 333 Niagara limestone, at 498.
- 334 Niagara limestone, at 480.
- 335 Niagara limestone.
- 336 Niagara limestone up to 493.  
Brick form of Halysites.  
Massive thin bedded and corall.  
337 Devonian at opening of line above a Fink  
Phacops pygmaea, spirifer divarica-  
tus in limestone clearly resembling  
Niagara limestone. Total thick-  
ness unknown. Excellent contact with  
Black slate.



Barrel

8  
road corner = 573 Limestone  
last but not the last.  
19 ft up = ferruginous nodules large  
& abundant.  
24 ft from base - ferruginous nodules  
large & abundant.  
32 ft up from base since 24 ft from  
base ferruginous nodules occur at base.  
42 ft from base, large & abundant,  
ferruginous nodules.  
53 ft up. Since 30 the Limestone  
is gradually becoming harder  
and more shaly but still  
weathering into soft clay.  
at 53 is plenty of ferruginous  
nodular material.  
Up to 637 ferruginous nodules  
are seen in the clay shale. These  
are not as abundant as  
lower down. Clay does not  
weather white and soft but  
tends to become broken up  
into shaly fragments  
weathering dark bluish gray, a  
light brown.  
At 643 is the first layer of  
rock like from freestone 4 in  
thick, with ferruginous nodules  
about 1/2 inch in diameter.  
A change from soft weathering  
clay to that weathering more  
shaly takes place about 624  
in which is a very gradual

From 643 to 660 occasional  
freestone layers, 2 to 3 in  
and occasional ferruginous  
nodules occur.  
Up to 681 since 660 the  
rock, with occasional  
nodules but no clayey part  
at least some well exposed  
at 725 there is ferruginous nodules  
but these have been crushed  
since 637 and none  
since 615, except at occasional  
intervals.  
Up to 745 there is clayey shale  
with very little ferruginous  
Collected clay between 695 and  
Up to 795 the rock is bluish clay  
rock, with ferruginous nodules  
rare. Fossils nearly but very few  
Up to 817 same as last  
rock  
Collected from 745 to 817 -  
Up to 830 from 817 a coarse  
part of the rock is indurated  
as to look like a breccia  
freestone, but it is not a  
specialty, weathering into  
a brown kind of rock as  
between 745 and 817.  
Between 817 and 830 the rock  
as a massive hard and  
but spalls and weathers to  
up rock.



At 863 the rock is slightly cherty and at 871 it becomes more distinctly cherty.

Up to 887 from 871 there are small fragments in crevices, but almost all of the rock consists of rock like upper wavy clay rocks badly cracked up into small fragments or layers, where they weathered.

Collected from 830 to 860.

Some northward along road from 986, the fossiliferous chert rises to 876. From 820 further S. = in conformity, I meet one at 874. at 869 somewhat cherty limestone.

Beneath this is upper wavy shaly clay rock.

Beneath this is the more solid fossiliferous like rock as on road east of D. rocks from 850 down to 800 and down to 780, much less solid so that it weathers shaly when long exposed but appears much more solid when freshly exposed.

Below this level the shaly clay wavy rock appears practically

without fossiliferous residues

than 674. No

except rare small

as a rocky platform

series of fresh ones

down, much

like layers found

still lower but exposures are too poor for measurement.

450 - No evidence of anything as low as Ginnetta clay in creek bed at 473, = 1 1/2 mi. S. of Smith Park Sta.

From Coral Ridge along the road following east side of a railroad, for 1/2 mile only, north from wavy above the Ginnetta clay is shown. Rest of this stretch as far as

451 there apparently is Ginnetta clay but exposures are poor.

452 - One & a half miles north west of Brooks shaly wavy just above Ginnetta clay, or top of Ginnetta clay. *Trematospira nodulosa* common in this clay.

Henry R. Sanders has been where specimens on B. with a small one found. About 10 miles east of home 1/4 mi. N. of 520 on west side of track.



453 NE of Brooks. Black slate & chert beneath.

454. Niagara l. with Walgnites & chert above. Chert with Lyellia. Presence or absence of Devonian not determined, at 500.

455 Black slate in field at road side, at 524.

456 Black slate on coarse crystalline. Top layer is with Silurian with Walgnites, 3 ft below contact of Dev. with Black slate. Therefore Devonian must be can not be thicker than 3 ft but may be thinner. Top of Dev. is not at 493.

457 Silurian limestone but no Dev. exposed here. It is not known whether Dev. limestone is present or absent here since Black slate is not seen.

done 11.15 to 2.00 p.m.  
1.08 going west  
5.45 " "

2 + 3.50 O.M. W. Inchester

Jas De Jarnatt  
Sarah De Jarnette

35-35.5 miles E of Versailles - about 30 ft thin bedded shaly rock, upper 5 ft with layers 3-4 in thick.

West of bridge 6.7, just west of house where it stopped during rain, 5th champion limestone.

At point 3.5 miles east of Versailles and for about 100 ft west of it. Arthropod fossils is abundant above the Strophomena zone of the Silurian. The top of the horizon is marked by Strophomena planumbona.

The Trilobites limestone occurs a short distance below the Strophomena zone and is much better bedded. Trilobites is abundant.



Fred Brann. Brooklyn NY,  
Allen.

Fordyce Knob.  $1\frac{3}{4}$  mi S of Borden.  
Top of hill.

- 20 ft. Chert, red soil, with spinifer 2 pieces  
47 ft shaley  
1 ft SS solid.  
1 ft SS solid.  
10 ft shaley  
8 ft SS intermediate, but is massive  
22 ft SS. massive.  
SS massive, with Derbya large  
+ fairly abundant in one or  
two layers.  
35 ft Massive SS with large Derbya  
at various intervals.  
24 ft weathering shaley. Probably is a  
underlying part originally  
16 ft indurated argillaceous white  
weathering shaley.  
18 ft indurated clay rock with spinifer  
and abundant Derbya.  
Forks of road.

West of Borden. N of RR. High  
end of bluff.

- 31 ft massive SS.  
132 + RR crossing up to massive  
Interval is shaly stuff.

Dr. Stalkers farm

McKinley Knob.  $\frac{1}{4}$  mi SW of Borden.  
Top of hill.

Chert. red soil. It all looks like.  
Contact uncertain.

33 ft + shaley.

- 6 in SS solid.  
11 ft shaley. + spinifer large area  
10 ft massive SS. with Derbya at intervals.  
Derbya common till age in the layer.  
30 ft. large Derbya common at various  
intervals.  
35 ft Derbya common at various  
intervals. Indurated argillaceous  
freestone, weathering shaley at  
various levels.  
20 ft Derbya rather rare.  
24 ft interval. Indurated argillaceous  
12 ft interval. shale  
70 ft softer argillaceous material  
22 ft down to crossing of road over  
creek.  
5 ft interval.

Hard rock layer in creek.  
The stuff in the bank looks like  
the stuff overlying the typical  
Givins clay, which forms the  
upper part of the New Providence  
formation.

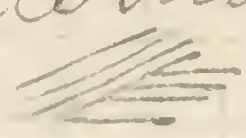


William M. Stone.

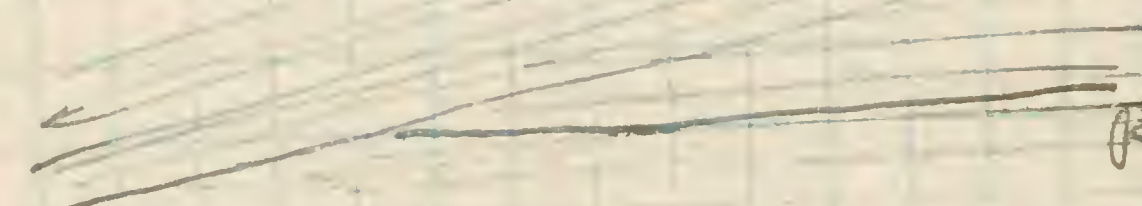
Curwood.

Limestone fossils 5 of bourn and  
also 500 yds SW of East locality  
on the road leading to Car-  
wood. Bazzards Rock.

1 3/4 mi E of Borden, along road S of RR.  
Lepidodendroid. 400 yds SW of Curwood.  
3 1/2 in wide. originally 4 in wide.  
15 in this long.

14 feet fossiliferous clay & mud.  
1 ft limestone.  
14 ft clay shale. Fenestellids.  
1 ft 3 in l. with Fenestellids.  
14 ft shale.  
top & in underlying clay shale at base  
5 ft limestone. Fenestellidae common.  
11 ft argillaceous rock, weathering shaly.  
40 ft very cherty in places. Lower 10 ft with  
argillaceous shaly coarse. upper part  
massive. Cherty near top. Fenestellae common.  
5 1/2 ft argillaceous rock with l. & sp.  
6 ft massive limestone.  
6 ft more shaly & argillaceous  
Uncertain to a fault   
along the line.  
show on the fresh vertical surface  
large crinoid stems. The west

the tops of some layers are full of  
the local Harrodsberg. Up a fully  
23 1/2 ft limestone, closely similar to  
2 ft limestone full of bluish cherty masses.  
13 ft blue argillaceous rock weathering shaly.  
The deposition was taken place west.  
tail the faulting a strongly unconformable  
somewhat cross-bedded.  
abundant of crinoid heads. white l.  
spots. fossils very scarce. Not even one  
grained, crinoid, white, cherty in  
29 ft Harrodsberg. coarse Harrodsberg

W  E.  
Fairview  
apparently an unconformable contact  
belonging to the same series.  
2 ft. More shaly than underlying rock, but be-  
14 ft massive sandy rock, rather argillaceous ss.  
with few crinoid stems & a few fossiliferous.  
66 ft argillaceous indurated bluish  
rock weathering shaly.



5 1/2 ft + argill. shale. Butter mounds  
 231 1/2 ft up from Oliv' shale crust  
 3 ft SS,  
 127 ft.

101 1/2 ft up  
 I - 4 ft Rhynchonella arvensis Common  
 8 1/2 ft crinoids &c up to this level.

89 ft up  
 2 to 3 1/2 ft H horizon, fossils plenty

G another iron nodular layer.  
 3 1/2 ft. fossils scarce  
 iron nodules

5 ft up to another iron nodular layer  
 fossils scarce.

77 ft up <sup>wp</sup> First heavy iron nodular layer = F  
 10 1/2 ft up. Fossils few.

E 1 ft up = 1 in l. = 66 1/2 ft up.  
 5 ft up = two in l.

D Another limestone layer = 60 1/2 ft up,  
 11 ft interval.

C 1/2 ft crinoidal limestone layer.  
 5 ft up interval.

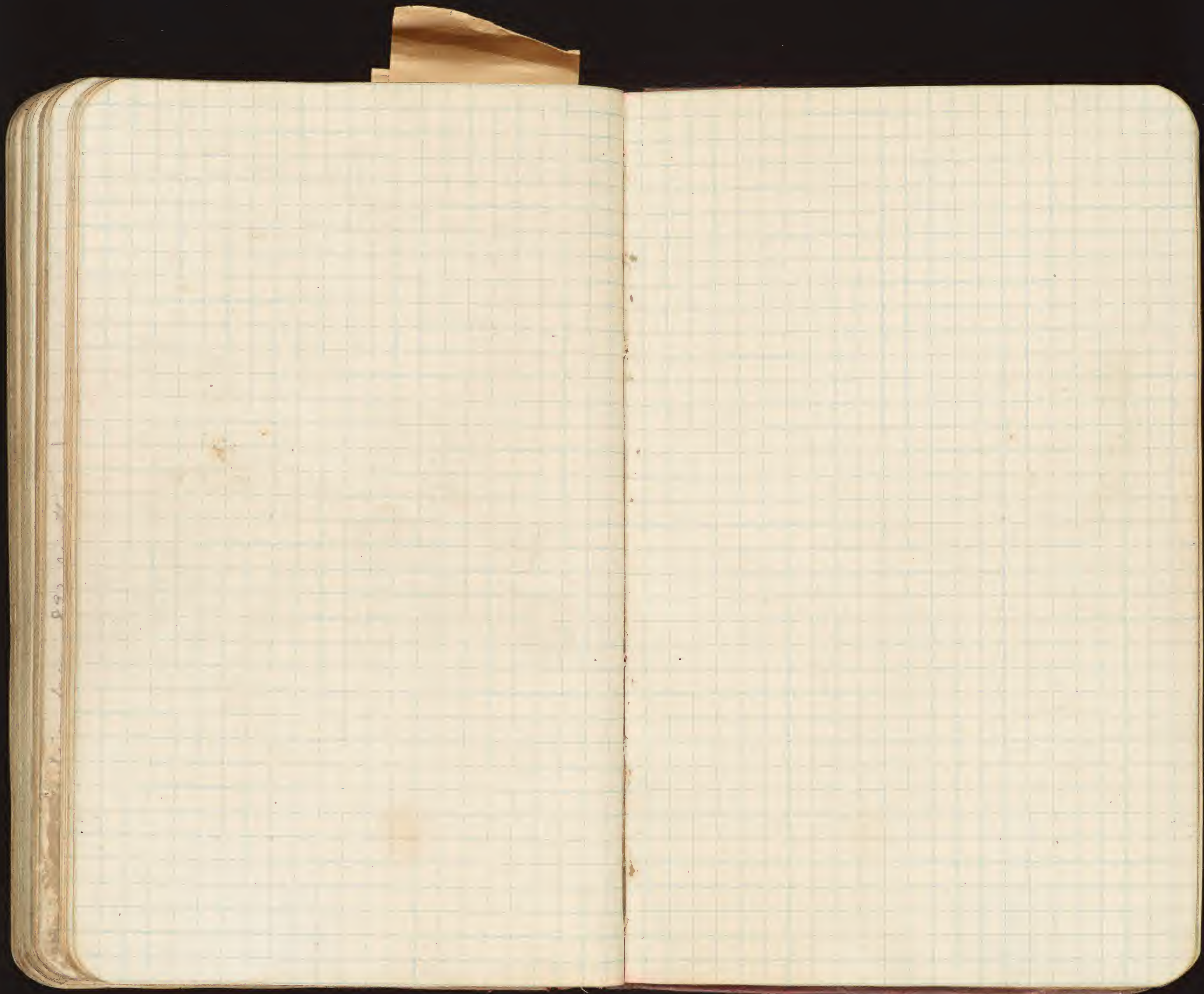
B-44 ft up = two inch crinoidal limestone to 6 in.  
 23 1/2 ft black slate to base of brick  
 exposure.

B Chief Rhynch. arvensis horizon.  
 B-C Rh. arvensis in this interval but not  
 very common.  
 D Chief ~~9~~ ~~9~~ horizon.

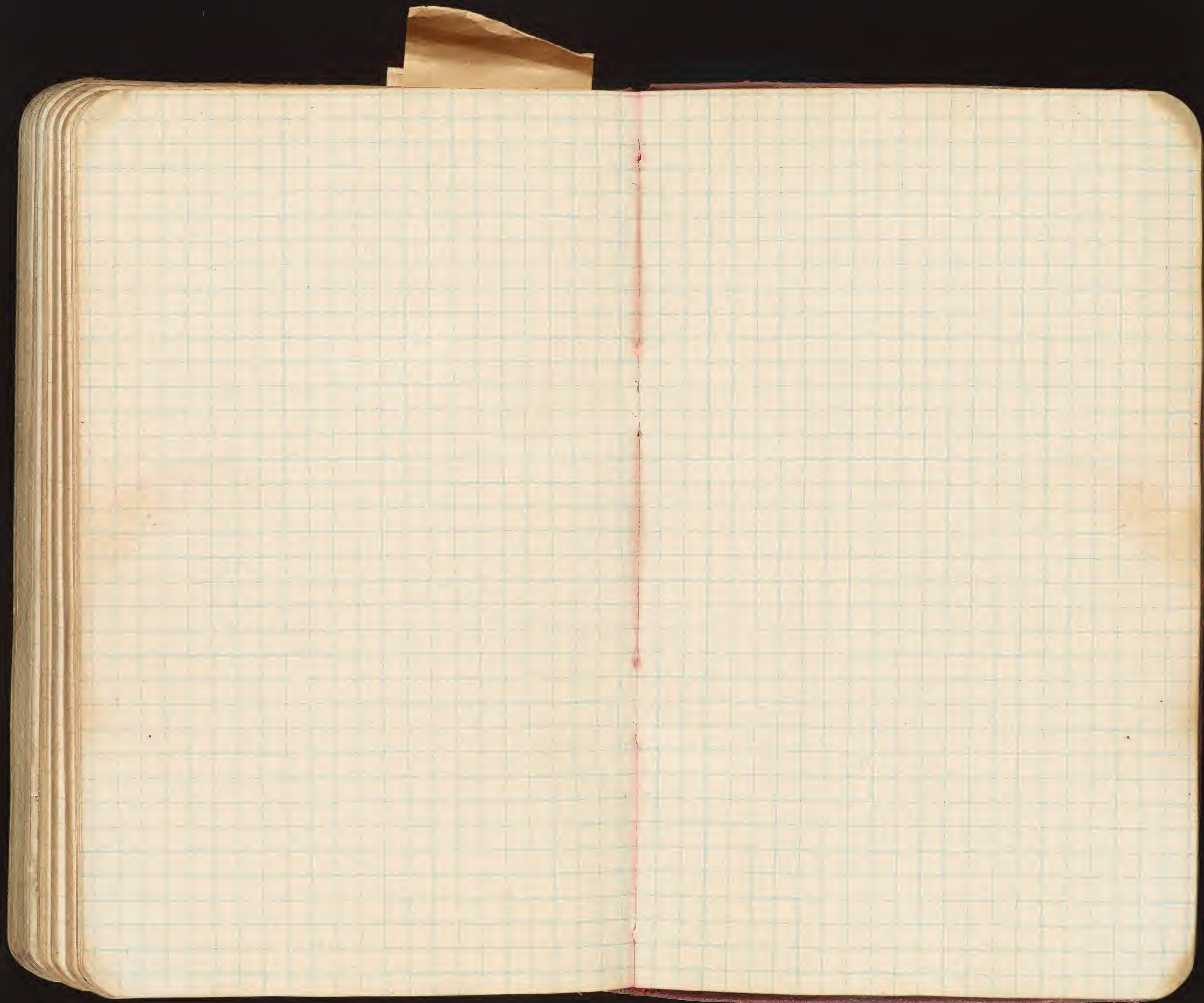
		127
		101
		228
	SS	
	228 1/2	
J	101 1/2	
I	97 1/2	
H	89	
G	85 1/2	
F	77	
E	66 1/2	
D	60 1/2	
C	49 1/2	
B	44	

C : : :  
 B : : :  
 44  
 23 1/2





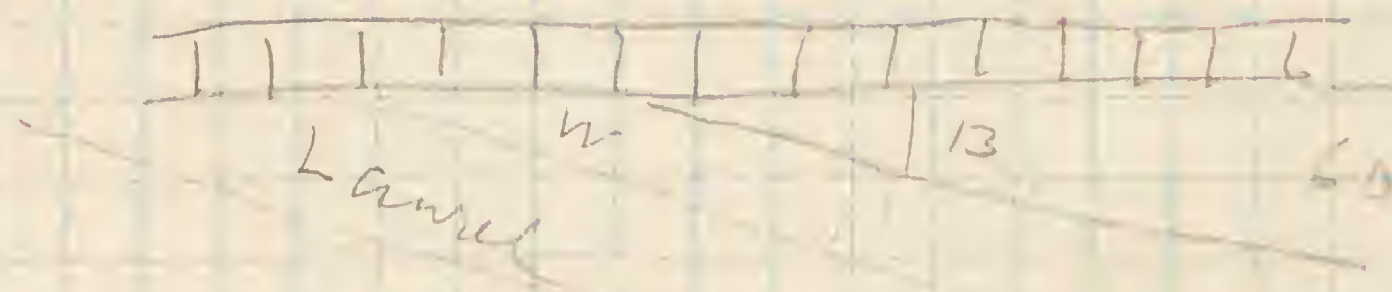






F. P. Hoover.  
Blomfield, Ky, 1887

590  
483





Sonder, Harvey, take road to  
Preachersville, at first lane on  
this side of bridge turn left,  
about 300 yds from pike to  
house, on south side of lane.  
Widow Jones lives there now.  
"1 1/2 mi. from Cr. Arch. N of hill  
toward Dix river, 300 yds from river.

Stand, John, north along Preachers  
ville road turn off at school  
house in N part of town,  
cross the Dix river, at Hunter  
Ford, about 1/2 mile beyond  
the Ford, on Fall Dick road

Foley, Andrew, from centre of  
town go east end then  
NE part the cemetery 200  
to 300 yards, "1/2 mi from  
centre of Cr. Arch. on Fall Dick road,  
Esperanza well, the one you can  
drive up to before you reach  
the bridge. - 1/2 mi section  
1 mi from Cr. Arch. on Lancaster  
pike.

Field Well at Crab Orchard  
Springs NW of Hotel 100 yds  
"in lot of property of Crab Orchard  
Springs"

Grave Well right across from  
the office of Crab Orchard  
Springs "in the yard of the  
property of Crab Orchard Springs,  
Mr Caldwell.

Sulphur water at Bann's  
Spring, well known. On  
Lancaster pike. Take next  
turn off toward E along  
lane, after passing the  
school house.

Salt Sulphur Water

Adams, A.

Crab Orchard Springs.

Bann's Spring, 1/2 mi. from Crab  
Orchard, on Lancaster Turn  
pike.

Howard Sulphur Well 1 1/2 mi.  
from Crab Orchard on the Hot  
Vermont road.

Bryant's Spring near Cr. Arch.  
in the valley. From Pas-  
tore Spring, Mr. St. on  
sulphur water. Many  
dear a summer resort.



How to determine Sp gr. of limestone.  
Other tests.

How to make use of boggy clay  
for drainage.

How to recognize presence of boggy  
clay.

Core drills rather than closed drills  
for testing. In core test at  
Tuckers reported 70 ft to bottom.

Springs, uniform layers of  
clay. Pits in clay residual  
for watering animals.

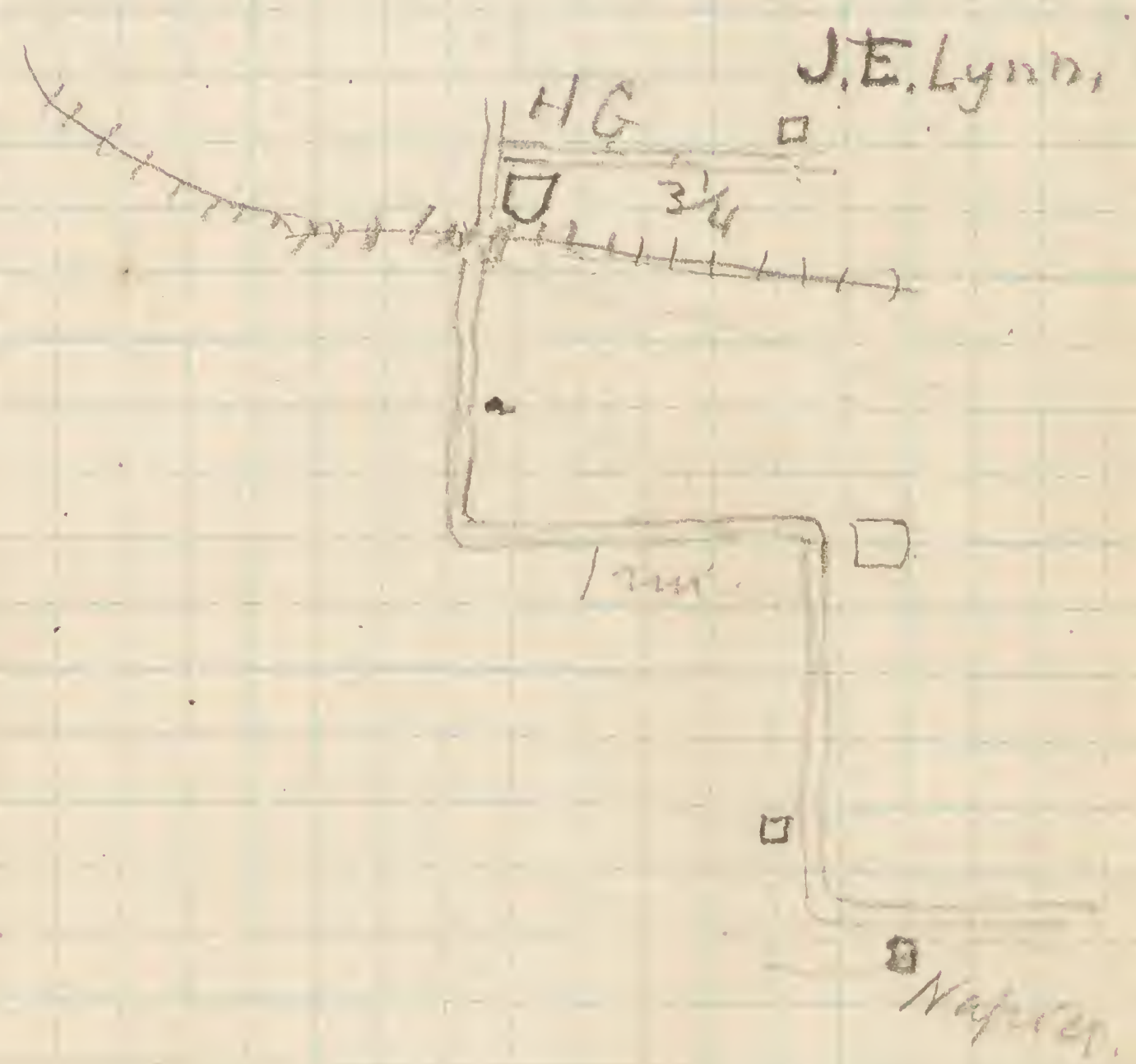
Strongly bent White shales prove  
large masses of weathering rock. Other  
were there would have been frac-  
turing instead of plication. Shales  
may not have been as much  
exposed then as now. Delmar  
all a lamaculate form plication  
splendidly.

Cultivation of Cedar on glades of boggy  
Purple color not found in Walden  
therefore a distinguishing  
feature of the boggy.

Southern origin of spruce and  
magnolia in the boggy.

Use of rocks useful in connection  
with placing of wells and  
creeperoles.

27 1/2 lb. tank





July 2 Monday S L 2 Jeffersonville

3 Tuesday B D S L 6

4 Wednesday B L 8

5 Thursday B S L 11

6 Friday B 12

7 Saturday

8 Mt Washington S L 19

Dinner at Ting B S L 20

Dinner at Louisville B S L 21

Rig West of Cedar Cr.  $\frac{1}{2}$  B D S L 22

Rig East of Cedar Cr.  $\frac{1}{4}$  B D<sup>2</sup> S L 23

Rig West of Cedar Cr.  $\frac{1}{4}$  B D<sup>2</sup> S L 24

Bonded on pike B D S L 25

W of McCulloughs Run B D 26

= whole week bond

2 $\frac{1}{2}$  days rig.

## Jeffersonville + Atlantic.

	P	a	P	a
Nicholas	7.18	11.00	2.27	6.55
Millers	7.54	11.38	1.48	6.14
Richmond	6.30	12.05	1.35	7.35 6.00
Panola	7.02	12.37	12.53	7.01
Swine	7.30	1.05	12.25	6.35
	a	P	a	



1) Epsom well J. E. Grove, Walled well at first, drilled in kettles. Afterwards dug to 10 feet hole in clay & spindled it.

2) E. L. Butler owner (Jim Kiblick)  
East of pike, between road to left W & road to right E in Kiddville.  
Dug well, walled up. Some found water here, but no salts made.

1) J. E. Grove. Dug making salts about 20 yrs ago. Made salts in a salt hole. Only well at Kiddville or vicinity where salts were made.

3) J. Harvey Boone, about 1 mi. SW. of Curry bridge. Nothing known about a well. He lived in the branch entering H road creek from the west.

4) Soda Spring is 75 yards west of the Oil Spring, on property of William Hule. would like to have chemical analysis.  
= SW of Hotel

5) L. D. Stone. From Right angle go west  $\frac{1}{2}$  mi. to fork of road. The Mt Sterling & Merrett. Then S on Merrett road. to first bend west. Stone lives just south of this bend.

Chilton PO discontinued. Last year Pigg's Stand (store.)

Louisville Oil & Gas Syndicate.  
W. W. Watts. Pres.  
Louisville. Ky.

P. B. Wind. Winchester.  
1480 ft. Oil Spring.

E. D. Veach Lexington.  
A. S. Webb

Kidd, E. O.  
Transylvania Co. Lexington.

George Mc Intosh  
The 7 ft Clay Layer in Plum Creek

Shaper.  
Nearly opposite bicycle store



Cincinnati to Winchester	Th.	2.80
Winchester a. b. b.	Th. Fr.	1.00
Winchester to Indian F.	Fr.	.40
Oil spring dinner	Fr.	.50
Indian F. to Clay City	Fr.	.25
Clay City sup. l. b.	Fr. Sa	1.00
Bag one day	Sa	3.00
Indian F. to d	Sa Su	2.00
Indian F. to Lexington	Su	1.00

		8.95
Lexington hotel, Monday	Su M	3.00
Lexington to Richmond	M	1.00
Bns	M	.25
Hotel G. G. G. G.	M Tu	1.00
Richmond to Panola	Tu	.40
Dinner	Tu	.25
Panola to Irvine	Tu	.35
Irvine to Richmond	Tu	.70
Hotel G. G. G. G.	Tu W	1.50
Bns	W	.25
Richmond to Mt. Vernon & return	W	.35
Rice & dinner	W	1.50
Hotel G. G. G. G.	W Th	1.50
Richmond to Mt. Vernon	Th	.20
		21.20

Dinner G. G. G. G.	Th	.25
Hotel G. G. G. G.	Th F	1.50
Back	F	1.15
Richmond to Stamford	F	1.04
Back	F	.15
Rice	F	1.50
Hotel St. Asaph Stamford	FS	1.00
Stamford to Lexington	S	1.45
		28.24

Sunday at Lebanon. Paid

Lodge (Thurs)

	5.26	9.2
1 Fri	1.9	12.1
	4.6	
1 Sat	11.9	24.0
Sunday		35.9

272 stops  
152



Linnetha clay NE of Berea, Linnetha  
 Duffin Layer Duffin cut  
 Limestone Duffin cut  
 x Phosphatic.  
 x Great Clay Irvine, Paula Crab & clay  
 x Waco lime.  
 Estill clay Irvine  
 v Elkins lime  
 Plum creek Paula  
 v Brassfield  
 v v Richmond Devonian l.  
 v Louisville upper.  
 v Louisville. lime  
 v Waldron clay  
 v Laurel volitic  
 v Laurel.  
 Orford clay. Bardston.  
 Clinton well bedded Bardston.  
 B & land Bardston.  
 Madison Bardston.  
 Prender Madison. Wt Washington

2.125 3.5 11 x 1 54  
 2.1  
 8.5 108 34 (3.2)  
 22 3.5 105 46  
 84 176

Intro.

522  
 430  
 72

522  
 25  
 497

Linnetha  
 Duffin.  
 Limestone  
 Phosphatic.  
 Great Clay  
 Waco.  
 Estill  
 Elkins.  
 Plum creek  
 Brassfield Paula.

v Louisville upper  
 v Louisville lower  
 Waldron Clermont

Laurel. Clermont, top of bed.  
 Orford. Come Spgs.  
 Clinton Gasburg Bardston.  
 B & land Gasburg Bardston

Bailey Willis.

All analyses in Shaler's  
 former reports etc.  
 + Analyses of well  
 Boyle Co. Clark Co.  
 pp. 119. pp. 173 etc.  
 pp. 279.



Look up wells of Gamard &c  
in old survey reports.

Indian Fields. Where did  
J. Harry Boone live?  
in saddle of Red River bridge 10 mi. out.

Whence sections  
2186, 2187. analyzed by  
Peters. 2 clays of Madison Co.

Indian Fields. 69.1

Black sulphur well.  
L. D. Stone on road from  
Kiddville to mouth of Red  
River.

Where was the Soda spring  
near Sulphur creek?

Washington Co.  
Where was Walt's Lick?  
Made salt here.

Libany m.

113 Where were the  
Plantation Licks, 2 mi. NW of  
Raywick.  
565 Clay Licks 1 mi S of Raywick.  
570 Able Spring 4 mi S of Libany  
573 mi.

Between Borton and Bardston.

Thickness of Louisville bed  
at Borton, 59

3/4 mi. E of Borton. 58

2 mi E of " 54. Devonian?

Devonian at 54 + 56.

Thickness of Botland at 56.

Between Borton + Balltown.

64. = 2 1/4 mi. E of Borton. Walden.

61. = Half way = Laurel.

74 = Laurel at Balltown.

Lower Laurel clay + limestone.

Come Springs section.

Gashburg section. Orgrad base.

Huntsville. Is Columnaria  
alveolata found here?

Crab Orchard. Location of following  
springs:

Grove  
Brown  
Field  
Howard  
Epsom  
Folly

Souder  
Bryant Chaley. Field  
Valley sulphur  
Knob sulphur  
Stone sulphur  
Well.



Wanted. Correct location of  
Wood lawn or Woodland and of  
Needmore with reference to  
Gasburg.

Dudderars mill on Dix river,  
reached from Richmond junc-  
tion (= Rowland) In going there  
Columbiana is crossed. wanted  
on map.

J.T. Lynn, about a mile from Hall's  
gap station. Rock quarried here,  
could be dressed with an axe.

East of Hall's Gap station 1 mi. on Chenoweth pike. in SE direction. Maywood  
= Hall's Gap S.E.

James' Mill on Dix river. on  
road to Prescheronville

Esper well at Mr. J. E. Groves  
Kiddville, In what bed was  
this well opened?

Olympian Springs.

Coniferous? about 1/2 mi.  
N. of main springs at  
old Chalybeate Spring.

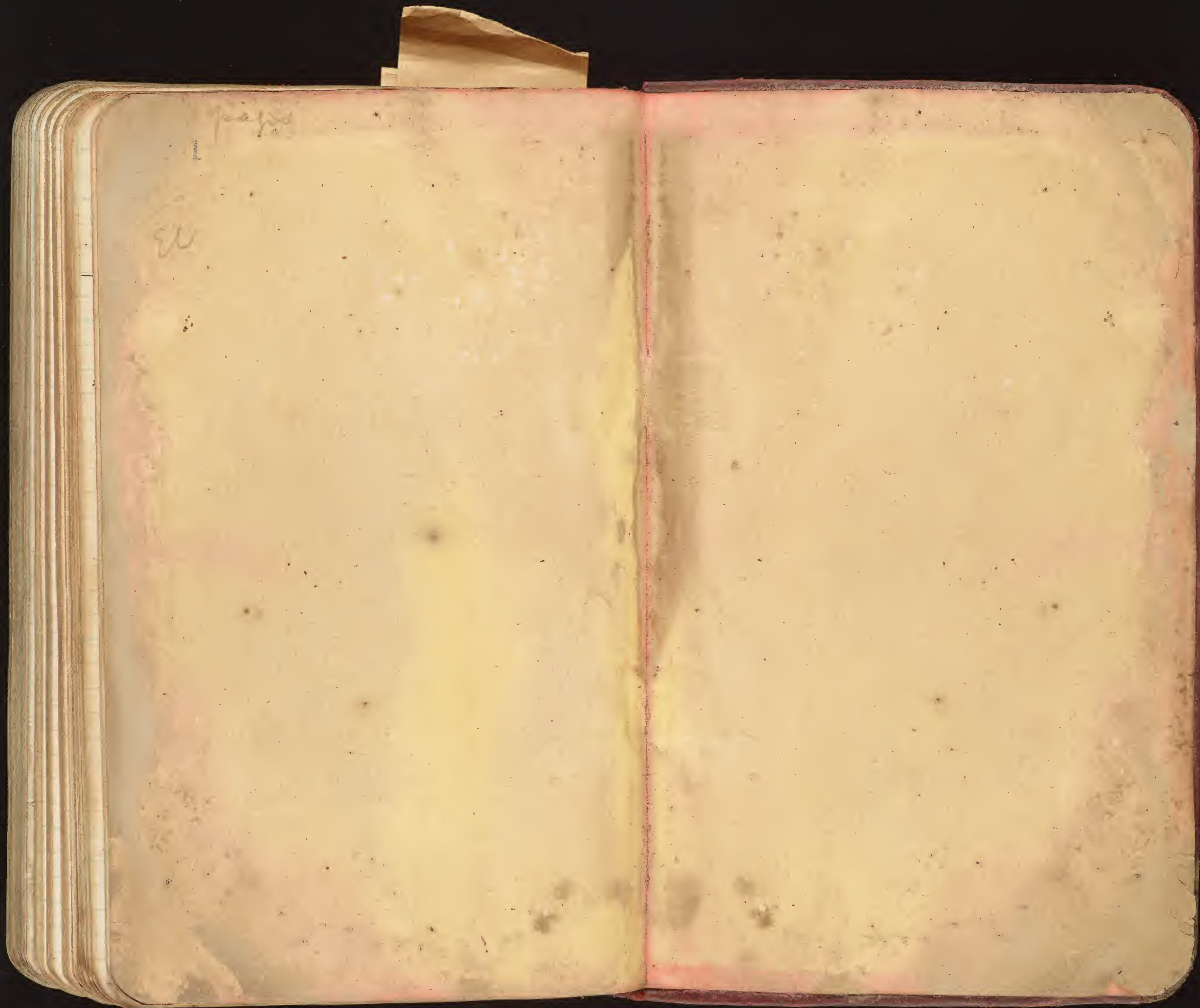
At Virden. G. D. Cook Prop.  
Hotel. Use water.

Prof. Harper.  
Clemson College

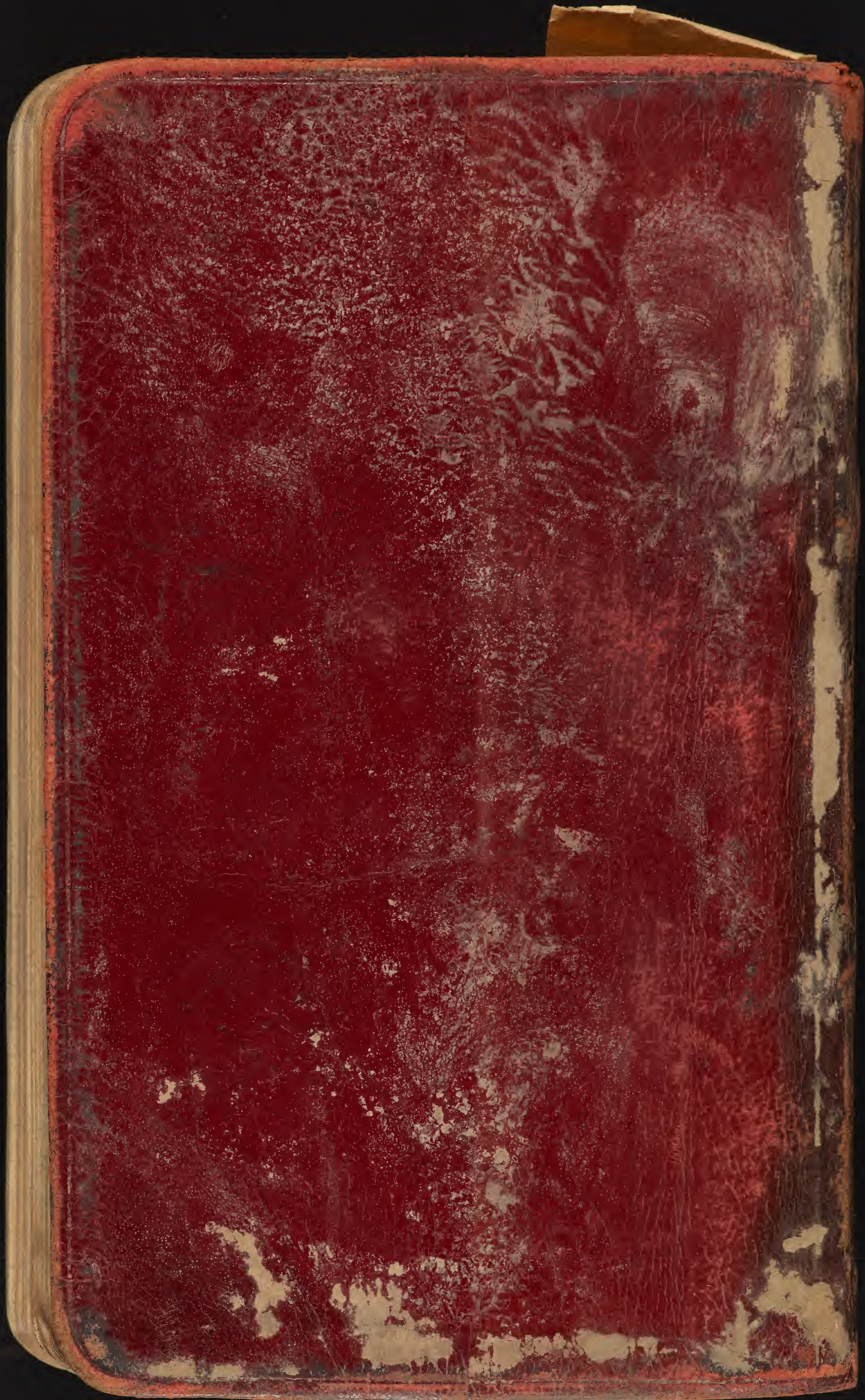
South Carolina

Tobacco.

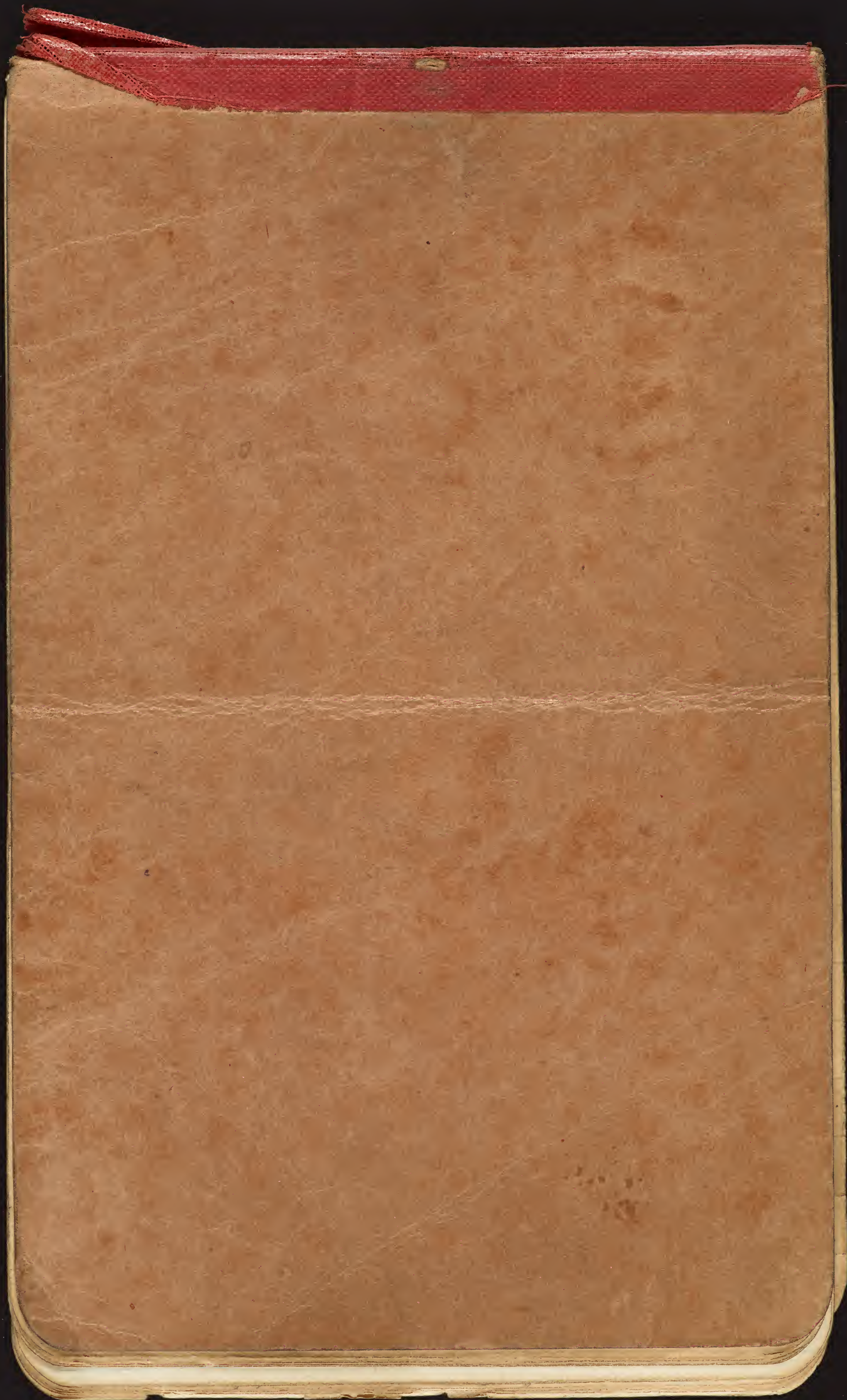
















D. W. D. D.

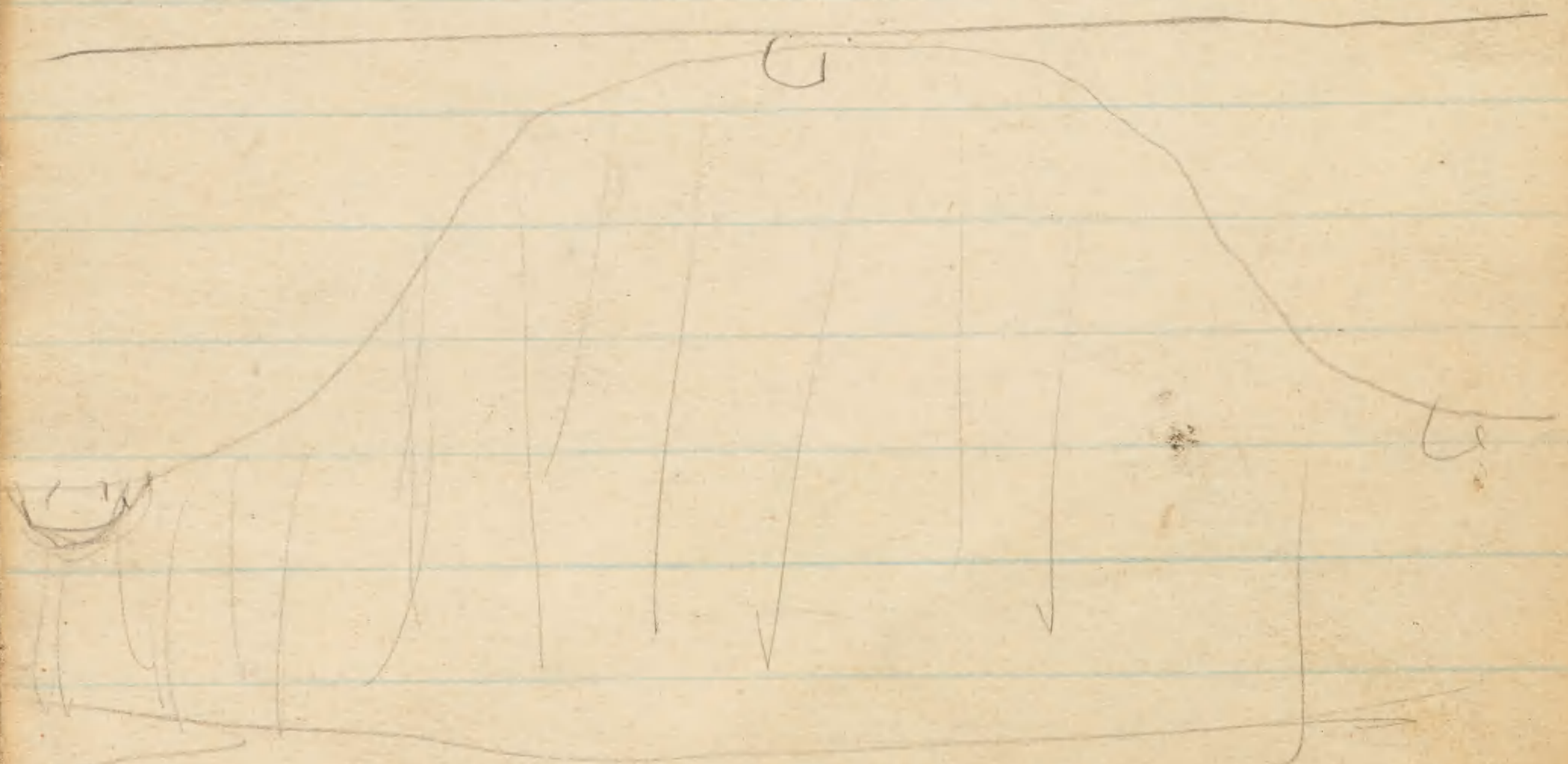


D W Dennis's  
Richmond  
Key of Fossils 1877.  
RR

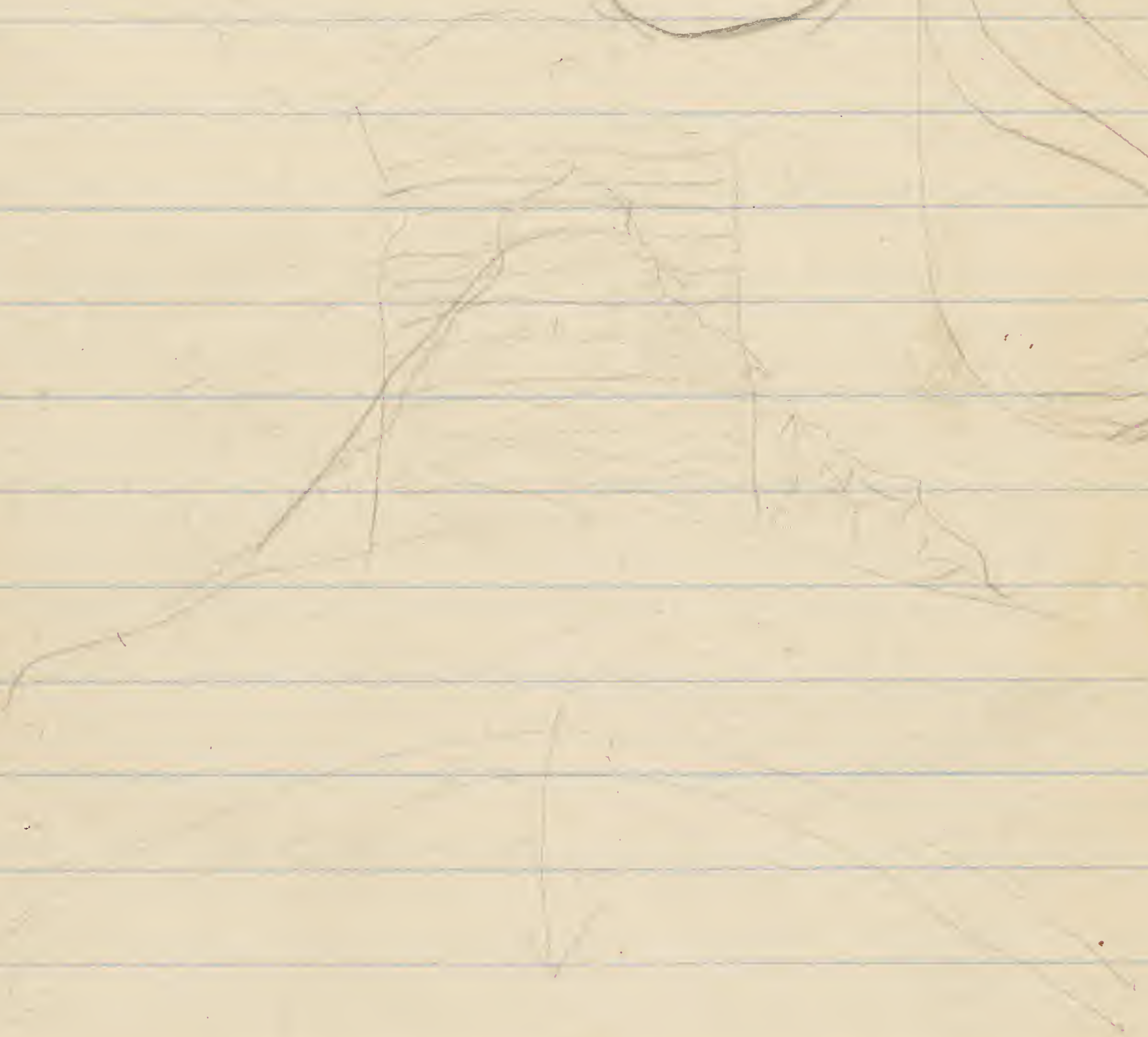
163 Vine Street

463

Noah Roads









# Willshire

Quarry East of Abandoned RR

Frimble quarry.

Beech quarry.

5' 6" (5 ft)

- 24 { 2 ft Porous massive l.  
9 ft medium porous massive l.  
5 ft 6 in. Very porous massive l. bituminous!  
7 ft 6 in. Massive l. Pentamerus cc at base.

Q { 2 ft 3 in. shaly.

- 21 { 3 1/2 ft. Massive l. + Stromatoceroids + large Halysites nexis.  
3 ft Limestone + shaly interbedded  
10 ft Massive layers Cyathophylloids. Limaria,  
Crimoidal fragments, Favosites, Cladaria,  
2 ft Massive l. weathering very soft. Crinoidal,  
fossiliferous fossils at west end of quarry,  
Favosites collected.  
2 ft 9 in Massive very poorly bedded layers or rather  
irregularly bedded.

R 6 ft 6 in Well bedded + laminated. Cherty. fossils few.  
Probably clayey beneath, at any rate  
quarry stops at this level.



Corruption quarry  
Frank Zink quarry  
S. of Marshall fork.

8 ft. { Pentamerus within 1 ft of base  
Same large Favosites with small cells at RR quarry.  
Cavernous l. weathering to rather  
thin bedded rubble Platyrama.

- Q { 3 ft Shaly, + many small Streptelasma flat on one side.  
2 ft 6 in Limestone Halysites nex large cc at top, chief Coral horizon  
3 in Shaly.
- 14 { 4 ft 3 in. Massive more cavernous,  
5 ft 6 in. Massive. Much less cavernous,  
1 ft 3 in. Massive layer.



84



Q

Quarry S of Walnut Street on W side of Clinton.  
This quarry is about S 30 W of Zink quarry.

14 3/4 ft

all in situ in upper part of quarry  
Echinophalus like one collected  
Stromatopora with radiate lining  
Strophodonta, short but broadly flattened  
Small globe small called Favosites  
Large Favosites conical globe  
small called  
Pointed flat-backed Strophodonta  
Halysites rex no large  
Concretions round stems only.

45  
28  
17 in

14 1/2 ft exposed limestone, below the 3 ft clay  
layer of the Zink quarry

31

31 ft interval, covered. going N 60 W to another  
quarry back of houses S of Walnut street.

1 1/2 ft

4 ft 6 in limestone weathering shaly but not cherty (R)  
6 in. grey l. somewhat crystalline  
2 ft 6 in. limestone weathering shaly

S { 6 in. hard l. grey. ripple marked. crests N 5 W 3 ft apart  
3 1/2 in. high  
4 in. hard l. grey.

R (Cherty shaly layers like those at R R quarry are  
represented along farm lane SW of quarry by  
flat chert fragments in soil)

31  
13  
18



Along farm lane SW of Lower quarry S of Walnut<sup>58</sup>

S>

10 ft interval.

T Whit field del. limestone. Exposed also westward along same farm lane but up the western hill side.

25 ft interval. See next page for shorter sight measurement.

V ~~Whit field del. cylindrica, Septaria, Plectambonites,~~  
~~Athyra reticulata, Schuchertella,~~  
~~Athyra canaliculata like~~



Hillston  
S of Walnut street.

Gully east of small stream,

poorly crinoidal limestone, solid.

11 ft interval.

T - crinoidal l. + Whitfieldella cc, *Athyra reticulata*,  
*Schuchertella*.

20 ft { 17 ft interval  
dark clay rock weathering soft.  
1 1/2 ft interval.  
1 1/2 ft brownish rock, sp. crinoidal in places

U 1 ft. crinoidal l. full of Whitfieldella, some  
*Athyra reticulata*.

8 ft { 1 1/2 ft interval, shaly limestone  
2 ft massive limestone, brown. Whitfieldella cc  
locally near middle of this layer  
2 ft. Weathering badly = brownish limestone.  
1 ft brownish l. fairly solid.  
1/2 ft shaly l. + soft shaly stuff  
1 ft. brownish l.



NE of B. Island

- 2 ft crinoidal l., interbedded with thin shaly l.  
 1 ft. with interbedded fine grained shaly limestone  
 4 1/2 ft moderately crinoidal l., massive  
 5 1/2 ft crinoidal l., massive <sup>specimen</sup> 48  
 14 ft massive l., somewhat crinoidal, massive 34  
 13 ft interval. measured E through the hill,

(T) Whitfieldella rock like one of the layers  
 at the localities S of Walnut Street  
 in small gulley N of Spring S of farm house  
 on E side of this hill.

Whitfieldella found at about same horizon  
 on West side of hill N of quarry — 21

11 1/2 ft of sandy l. exposures, best exposed  
 in lower 3 ft of section. — 9 1/2

U 1/2 ft very typical Whitfieldella layer here. — 9

9 ft brownish l. massive,

Top of Crab Orchard clay shale.



# Hillston Condensed section

30?	Hillston ss.	157½
P	11 ft Black bituminous shaly l. + Pontanensis	146½
61	26 ft Covered.	120½
	24 ft exposed at RR quarry = Pontanensis beds.	96½
Q	3 ft shale with flat backed Streptelasma	93½
	3½ ft massive l. + Halysites rexus	
	3 ft limestone + shale interbedded	
21	10 ft. Mississippian l. chals.	
	2 ft Large Favosites collected.	
	2¾ ft massive l. Very irregularly bedded	72½
R	6½ ft Well bedded + laminated cherty shaly l. <sup>Trinable</sup> <sub>hill</sub>	66
	15 ft Covered - S of Walnut St.	61
	13 ft Coarse crinoidal in part - Covered S of Walnut St.	48
	7½ ft additional at Bisher dam } massive l. exposed also at Bisher dam	
5	½ ft Poorly crinoidal l. <sup>Ripple marked</sup> <sub>S of Walnut St</sub>	
	10 ft interval.	
T	½ ft. Whitfieldella. open layer.	
	20 ft chiefly ls with arch.	48
U	½ ft Whitfieldella co.	
61	9 ft brownish l. massive	0
	62 ft Crab Orchard Clay	
	3½ ft Dayton	
	5 ft ferruginous Clinton with lower 1 ft strongly cross bedded	
	½ ft strongly wave marked layer.	



46 41.0 (9-  
41.4

36) 28.0 (8  
21.8

NE 1/4 B. 12 S. 12 E. 12 N.



Read manuscript for week of 189.  
Oct. 24. VIII. Co. 11. 11. 11.

NE of Birkers dam

Top of quarry NE of Birkers dam,  
55 ft interval. All massive rock.

9 ft greenish with lower 3 ft possibly Crat. Archimed.

5 1/2 ft dark grey Crat. Archimed. } 6 1/2  
6 1/2 ft continuous Crat. Archimed. clay

3 1/2 ft Dayton Crat. Archimed.

4 ft strongly ferruginous Chert, very irregularly  
bedded, lens-shaped masses common.

1 ft strongly crossbedded ferruginous Chert.

Ripple marks N 50 W crest 2 - 2 1/2 ft apart  
2 1/2 in above N 50 W. Crossbedded toward  
South.

6 in layer N  S



# Gulley Hill.

Hillsboro co. Love.

- 61 { 11 ft black bituminous shaly li. stuff with  
Pentamerus in part of greenstone.  
24 ft interval  
Road looks of Marshall like toward south  
26 ft interval.  
Base of Pentamerus zone  
Flat & irregular layer.



Hillston  
College & Ambrose hills

There is no certainty where the basal beds of the Pentamerous beds in the following section come in. Hence the crinoidal limestone may come in in the lower part of the Pentamerous section. Apparently, however, the crinoidal beds have a strong local westward dip here.

Westward  $\frac{1}{2}$  mi. along the Danville pike there is a quarry S of the road with *Strophodonta* with flat back in upper part of thick basal rock. The underlying rock should be the basal part of the Pentamerous zone lithologically but contains no Pentamerous.  $\frac{1}{8}$  mi W, but N of Danville pike, is quarry with Pentamerous at top but not in underlying section. About 10 ft lower is blue limestone top with flat backed *Strophodonta*. At quarry mentioned S of Danville pike the blue l. is underlain by shaly cherty beds as at RR quarry, but blue l. here is thinner.

On Danville pike. SW of Hillston.  
Pentamerous! base not known.

15 ft. interval.

13 ft crinoidal l. NW of <sup>old</sup> College but along  
on Cincinnati pike

crinoidal l. may correspond to lower part of  
Pentamerous l. section,



Measurement of Pel. in G. n. n.

St. I. Plants, Spruce St. I.

Age of St. I. plants, etc. St. II

St. II. Paleontology. St. 3+4

Crustaceans - Insects, etc.

Site cut + cut. Cyl. deposits.

mill + stone, etc.

Grain + log, etc.

XV

Willard's corals, etc. St. 2.

Gr. cut. of L. n. n. etc.

Gr. in G. n. n. etc.

Run up 7 feet from

other points.

Pel. St. III. St. n. n. etc.

St 3+4

Pel. St. IV. Cuts + n. n.

XVI

Archaeological excavations, etc.

St 4.

Pel. Cuts 5, St. V. n. n.

XVII, St. 1

mill + Pel. n. n.

St 3.

Cuts, n. n. etc.

XVIII

Pel. St. VI. n. n.

St. 1



Meandering Rd. in Camp.

St. I. Plant, Spruce St. I.

Along St. I. Plant beds St. II

St. II, Paleontology, Q4, 3+4,

Crinoid stems - small white.

Subcut + Carb. Cyl. dipods.

millent + other, shales, about + 127

XV, 211 (dipods) columns, white, Pt 2, on coll. 2, with small, other fossils.

On coll. in other coll. from top of beds brown.

Other fossils. Rd. Pt. III, Stenactyon.

Pt 3+4, Rd. Pt IV. Crin. + Murch.

XVI, Stenactyon, Agassiz, Pt 2+3, Fossils, green, etc.

Pt 4, Rd. in 5a, Pt V, Murchison.

XVII, Pt 4, Miller + Foss. Fossils.

Pt 3, Crin. Fossils, Miller + Foss.

XVIII, Rd. Pt. VI, Murchison.

Pt 1+2, Rd. Pt VII, Fossils, etc. Pt 3+4, Rd. Pt VIII, Fossils, etc.



Measurement of Dist. from G.A. up.

II 29

$1 + \varepsilon, 2$

Chlorophyll  $a$  - 20 mg/L

Mr. Kent & Son,  
Odent + 127  
Spa Co.

Will edit report concerning the

On cult. of the south.

Now try 1 with Cesium.

Rec. Pt. III, Stenograph.

Oct 3 + 4, Oct. 17 + 18. Cnido + Mnt.

[illegible]

Fruchtlos, Baum, 20.

Pat. Cu. Gr. P.V. Montcalm

Wm. W. + O. W. F. W. W.

Ans. Frank, Mills & Felt

Oct. 21, 1891



Memorandum of Pat. in Camp.

St. I. St. I. Springs

Age of St. I. Springs beds

St. II. Paleontology.

Crinoid stems - large, etc.

Subcut + Carb. Cyl. deposits.

millstone + 12' shale.

XV. 211' of red sandstone, with 2' of water

St. 2. On cutting, 1st cuttings. Dug in from bed. New top of beds known. Other fossils.

Pat. St. III. St. III. etc.

St. 3 + 4. Pat. St. IV. Cret. + Miocene

XVI. 212' of red sandstone, with 2' of water

St. 4. Pat. in St. V. Miocene

XVII. St. 1. Millstone + Pat. St. 3. Cret. + Miocene

XVIII. Pat. St. VI. Miocene

Crinoid stems



Statement of Debt. Can't make.

Dr. anti. Sprung

Agree to the statement below.

St II. Paleontology.

Chlorophyllum - 20-25% in L.

Sutent + Carb, Cephalexin.

$m \cdot \Delta t + \theta - \Delta t$   
 $\Delta t + 127$

*2111 di Ziboni conus no. 2111a*

Gr. coll. 2, 1st south no.

Order in *Pharm. Act.*  
New York, 1880.

Atkins 120000

Page, 07, III, St. Vincent, 1900.

3 + 4 = 7

*Dr. J. H. C. C. C.*

Fruchtbar, gesund, etc.

Dist. Cu. 51, 84 v, 92 v, 93 v, 94 v, 95 v, 96 v, 97 v, 98 v, 99 v, 100 v, 101 v, 102 v, 103 v, 104 v, 105 v, 106 v, 107 v, 108 v, 109 v, 110 v, 111 v, 112 v, 113 v, 114 v, 115 v, 116 v, 117 v, 118 v, 119 v, 120 v, 121 v, 122 v, 123 v, 124 v, 125 v, 126 v, 127 v, 128 v, 129 v, 130 v, 131 v, 132 v, 133 v, 134 v, 135 v, 136 v, 137 v, 138 v, 139 v, 140 v, 141 v, 142 v, 143 v, 144 v, 145 v, 146 v, 147 v, 148 v, 149 v, 150 v, 151 v, 152 v, 153 v, 154 v, 155 v, 156 v, 157 v, 158 v, 159 v, 160 v, 161 v, 162 v, 163 v, 164 v, 165 v, 166 v, 167 v, 168 v, 169 v, 170 v, 171 v, 172 v, 173 v, 174 v, 175 v, 176 v, 177 v, 178 v, 179 v, 180 v, 181 v, 182 v, 183 v, 184 v, 185 v, 186 v, 187 v, 188 v, 189 v, 190 v, 191 v, 192 v, 193 v, 194 v, 195 v, 196 v, 197 v, 198 v, 199 v, 200 v, 201 v, 202 v, 203 v, 204 v, 205 v, 206 v, 207 v, 208 v, 209 v, 210 v, 211 v, 212 v, 213 v, 214 v, 215 v, 216 v, 217 v, 218 v, 219 v, 220 v, 221 v, 222 v, 223 v, 224 v, 225 v, 226 v, 227 v, 228 v, 229 v, 230 v, 231 v, 232 v, 233 v, 234 v, 235 v, 236 v, 237 v, 238 v, 239 v, 240 v, 241 v, 242 v, 243 v, 244 v, 245 v, 246 v, 247 v, 248 v, 249 v, 250 v, 251 v, 252 v, 253 v, 254 v, 255 v, 256 v, 257 v, 258 v, 259 v, 260 v, 261 v, 262 v, 263 v, 264 v, 265 v, 266 v, 267 v, 268 v, 269 v, 270 v, 271 v, 272 v, 273 v, 274 v, 275 v, 276 v, 277 v, 278 v, 279 v, 280 v, 281 v, 282 v, 283 v, 284 v, 285 v, 286 v, 287 v, 288 v, 289 v, 290 v, 291 v, 292 v, 293 v, 294 v, 295 v, 296 v, 297 v, 298 v, 299 v, 300 v, 301 v, 302 v, 303 v, 304 v, 305 v, 306 v, 307 v, 308 v, 309 v, 310 v, 311 v, 312 v, 313 v, 314 v, 315 v, 316 v, 317 v, 318 v, 319 v, 320 v, 321 v, 322 v, 323 v, 324 v, 325 v, 326 v, 327 v, 328 v, 329 v, 330 v, 331 v, 332 v, 333 v, 334 v, 335 v, 336 v, 337 v, 338 v, 339 v, 340 v, 341 v, 342 v, 343 v, 344 v, 345 v, 346 v, 347 v, 348 v, 349 v, 350 v, 351 v, 352 v, 353 v, 354 v, 355 v, 356 v, 357 v, 358 v, 359 v, 360 v, 361 v, 362 v, 363 v, 364 v, 365 v, 366 v, 367 v, 368 v, 369 v, 370 v, 371 v, 372 v, 373 v, 374 v, 375 v, 376 v, 377 v, 378 v, 379 v, 380 v, 381 v, 382 v, 383 v, 384 v, 385 v, 386 v, 387 v, 388 v, 389 v, 390 v, 391 v, 392 v, 393 v, 394 v, 395 v, 396 v, 397 v, 398 v, 399 v, 400 v, 401 v, 402 v, 403 v, 404 v, 405 v, 406 v, 407 v, 408 v, 409 v, 410 v, 411 v, 412 v, 413 v, 414 v, 415 v, 416 v, 417 v, 418 v, 419 v, 420 v, 421 v, 422 v, 423 v, 424 v, 425 v, 426 v, 427 v, 428 v, 429 v, 430 v, 431 v, 432 v, 433 v, 434 v, 435 v, 436 v, 437 v, 438 v, 439 v, 440 v, 441 v, 442 v, 443 v, 444 v, 445 v, 446 v, 447 v, 448 v, 449 v, 450 v, 451 v, 452 v, 453 v, 454 v, 455 v, 456 v, 457 v, 458 v, 459 v, 460 v, 461 v, 462 v, 463 v, 464 v, 465 v, 466 v, 467 v, 468 v, 469 v, 470 v, 471 v, 472 v, 473 v, 474 v, 475 v, 476 v, 477 v, 478 v, 479 v, 480 v, 481 v, 482 v, 483 v, 484 v, 485 v, 486 v, 487 v, 488 v, 489 v, 490 v, 491 v, 492 v, 493 v, 494 v, 495 v, 496 v, 497 v, 498 v, 499 v, 500 v, 501 v, 502 v, 503 v, 504 v, 505 v, 506 v, 507 v, 508 v, 509 v, 510 v, 511 v, 512 v, 513 v, 514 v, 515 v, 516 v, 517 v, 518 v, 519 v, 520 v, 521 v, 522 v, 523 v, 524 v, 525 v, 526 v, 527 v, 528 v, 529 v, 530 v, 531 v, 532 v, 533 v, 534 v, 535 v, 536 v, 537 v, 538 v, 539 v, 540 v, 541 v, 542 v, 543 v, 544 v, 545 v, 546 v, 547 v, 548 v, 549 v, 550 v, 551 v, 552 v, 553 v, 554 v, 555 v, 556 v, 557 v, 558 v, 559 v, 560 v, 561 v, 562 v, 563 v, 564 v, 565 v, 566 v, 567 v, 568 v, 569 v, 570 v, 571 v, 572 v, 573 v, 574 v, 575 v, 576 v, 577 v, 578 v, 579 v, 580 v, 581 v, 582 v, 583 v, 584 v, 585 v, 586 v, 587 v, 588 v, 589 v, 590 v, 591 v, 592 v, 593 v, 594 v, 595 v, 596 v, 597 v, 598 v, 599 v, 600 v, 601 v, 602 v, 603 v, 604 v, 605 v, 606 v, 607 v, 608 v, 609 v, 610 v, 611 v, 612 v, 613 v, 614 v, 615 v, 616 v, 617 v, 618 v, 619 v, 620 v, 621 v, 622 v, 623 v, 624 v, 625 v, 626 v, 627 v, 628 v, 629 v, 630 v, 631 v, 632 v, 633 v, 634 v, 635 v, 636 v, 637 v, 638 v, 639 v, 640 v, 641 v, 642 v, 643 v, 644 v, 645 v, 646 v, 647 v, 648 v, 649 v, 650 v, 651 v, 652 v, 653 v, 654 v, 655 v, 656 v, 657 v, 658 v, 659 v, 660 v, 661 v, 662 v, 663 v, 664 v, 665 v, 666 v, 667 v, 668 v, 669 v, 670 v, 671 v, 672 v, 673 v, 674 v, 675 v, 676 v, 677 v, 678 v, 679 v, 680 v, 681 v, 682 v, 683 v, 684 v, 685 v, 686 v, 687 v, 688 v, 689 v, 690 v, 691 v, 692 v, 693 v, 694 v, 695 v, 696 v, 697 v, 698 v, 699 v, 700 v, 701 v, 702 v, 703 v, 704 v, 705 v, 706 v, 707 v, 708 v, 709 v, 710 v, 711 v, 712 v, 713 v, 714 v, 715 v, 716 v, 717 v, 718 v, 719 v, 720 v, 721 v, 722 v, 723 v, 724 v, 725 v, 726 v, 727 v, 728 v, 729 v, 730 v, 731 v, 732 v, 733 v, 734 v, 735 v, 736 v, 737 v, 738 v, 739 v, 740 v, 741 v, 742 v, 743 v, 744 v, 745 v, 746 v, 747 v, 748 v, 749 v, 750 v, 751 v, 752 v, 753 v, 754 v, 755 v, 756 v, 757 v, 758 v, 759 v, 760 v, 761 v, 762 v, 763 v, 764 v, 765 v, 766 v, 767 v, 768 v, 769 v, 770 v, 771 v, 772 v, 77

Middle + Coll. Franks

Am. Fr. 20. 20. 20

XVIII. Col. 27, 16. <sup>of 17.</sup>

174 = 1110



Measure of Prod. in Europe.

Dr. anti. Spranger

Agree to the Pleasure of the

Oct II. Pa. 6. 1877.

Christina - 21/07/16.

Set out + Conf. Cpl. & J. & K.

mm. 11.5 + 0.5 = 12.0  
0.5 + 12.0 = 12.5

XV, 211 & 212 of 1900, 1911 & 1912. 211 & 212 of 1900, 1911 & 1912. 211 & 212 of 1900, 1911 & 1912.

On coll. of *Lept. anthrac.*  
Type in *Lept. anthrac.*  
Near top of *Lept. anthrac.*  
At the bottom.

Pal. 07, III, Stenotrypa

Oct. 3 + 4, Oct. 7 + IV, Cnido + 21 minutes

[illegible]

Pat. Cui Sa. P.V. monthly.

XVII, 245. Miller & Fellows.

pt 3. Ant. Fronto. Middle Folds

B C D N E G D after all these

minerals from a general  
wide spread in the North -



Millinery of Pot. Lin. 5a. 1/2

St. I. Plants. Springs

St. II

Agony of St. 8. 1/2

St. 3+4

St. II. Pale yellow

Crabapple - 1/2

St. 1. 1/2

St. 1. 1/2

St. 2

St. 2. 1/2

St. 3+4

St. 1. 1/2

St. 4

St. 3. 1/2

St. 1. 1/2

St. 1. 1/2



mounting of Pat. in Camp.

St. I. Staut. Springs

Age of St. I. Staut. Springs

St. II. Pat. & nothing. Q4, 3+4, Cretaceous - 2000 ft. E.

Sut. cut + Carb. Cyl. dip. m. St. II. Staut. Springs

XV. 2000 ft. St. I. Staut. Springs

St. 2. 2000 ft. St. I. Staut. Springs

Pat. St. III. Staut. Springs

XVI. 2000 ft. St. I. Staut. Springs

St. 4. Pat. in St. I. Staut. Springs

XVII. St. 4. Pat. in St. I. Staut. Springs

XVIII. Pat. in St. I. Staut. Springs

Pat. in St. I. Staut. Springs

Pat. in St. I. Staut. Springs



877  $\frac{7}{2}$  4550

27 1/2 132 cm / 1.28 m

54 87 516

1.  $\frac{1}{2} \pi$  (90°)  $\rightarrow$   $\frac{1}{4} \pi$  (45°)

9161

1872. II. B. F. 15. 19.

from down. Over the top.

White House, N.Y.

F. 3, D.

*Phoradendron australe, Benth.*







No. 364.

NOTE BOOK

OXFORD